

STRATEGY AND THE USE OF AIRPOWER ON THE EASTERN FRONT:
LESSONS FOR THE AIRPOWER STRATEGIST

BY

LIEUTENANT COLONEL DAVID A WILLIAMSON

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APPROVAL

The undersigned certify that this thesis meets masters-level standards of research, argumentation, and expression.

DR. RICHARD R. MULLER (Date)

DR. MICHAEL L. GRUMELLI (Date)

DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the US Government, Department of Defense, the United States Air Force, or Air University.

ABOUT THE AUTHOR

Lieutenant Colonel David Williamson was commissioned in 1995 through the United States Air Force Academy with a Bachelor's degree in Civil-Environmental Engineering. He graduated from pilot training at Sheppard AFB in 1997 and went on to fly the F-15C at Langley AFB, Virginia. After this assignment, he applied for entrance into the B-2 program where he served as an instructor in the T-38 and B-2. Lieutenant Colonel Williamson subsequently volunteered to become an Air Liaison Officer (ALO) in Korea which afforded him the opportunity to attend Air Operations Center training, liaise with both the US and Republic of Korea Army, and serve in an Air Support Operations Center. Lieutenant Colonel Williamson subsequently returned to Whiteman AFB where he completed the B-2 Weapons Instructor Course. In July of 2008, Lieutenant Colonel Williamson was assigned to Maxwell AFB where he attended Air Command and Staff College and the School of Advanced Air and Power Studies. Upon completion of the School of Advanced Air and Space Studies, Lieutenant Colonel Williamson will return to Whiteman AFB to fly the B-2. As a senior pilot, he has accumulated over 1740 flying hours in the F-15C, T-38, and B-2.

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*The fear of the LORD is the beginning of wisdom; all
those who practice it have a good understanding...*
Psalm 111:10

*The fear of the LORD is the beginning of knowledge;
fools despise wisdom and instruction.*
Proverbs 1:7

ABSTRACT

The Eastern Front is likely the least appreciated and least understood component of the Second World War. This is especially unfortunate since it contains some of the richest lessons about strategy and the application of airpower while faced with an imminent and existential threat. This study investigates several of these lessons and concludes that, despite the significant impact allied efforts had on the Western Front, their efforts were ultimately of secondary importance compared to the costly and more grueling efforts of the Soviet Union in defeating Germany. Furthermore, despite the fact that Soviet airpower diverged from patterns preferred by US strategic airpower thinkers, the Soviet air force (VVS) developed into an enormously successful and competent air arm which warrants further study, investigation, and consideration. The VVS utilized airpower very differently than did the United States, and yet its ability to reestablish air superiority and decisively contribute to national victory was truly impressive. While allied strategic bombing efforts increased friction, reduced German freedom of action, and reduced available German resources, it was ultimately unable to produce the decisive results they had hoped. Instead, the fortuitous combination of the Red Army, VVS direct and indirect support and deep interdiction operations, time, distance, and the unforgiving Soviet winter produced the most tangible strategic effect: the destruction of 6.5 million German soldiers on the Eastern Front.

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Introduction to Eastern Front Strategy and Airpower

Western historians have displayed little interest in the dramatic air war between the Luftwaffe and the VVS between 1941 and 1945. The unparalleled success of the Luftwaffe in Operation Barbarossa in 1941 fixed in Western historical consciousness a vivid image of an oversized, poorly equipped, and ineffectual air force destroyed in one preemptive strike. From that moment forward the vertical dimension of the war in the east receded into the background for many Westerners.

Von Hardesty, Author and Historian

In April 1946, less than one year after the end of the Second World War, General Carl Spaatz published an article in *Foreign Affairs* entitled “Strategic Air Power: Fulfillment of a Concept.” He began this article with a curious and counterfactual statement. He stated, “World War II might have ended differently had our enemies understood and made correct use of Strategic Air Power.”¹ Many commentators have followed suit, arguing that the air forces of the Western Allies applied the “correct” form of airpower through strategic bombardment, while other nations chose less effective paths. At the risk of bringing discredit upon the theories of past heroic eras and heroic men, Spaatz’s claim is doubtful.

A brief look at Spaatz’s article reveals that the American mindset and analysis of Second World War airpower strategy, performance, and circumstances is incomplete. Students of air strategy must seek to advance the field via a thorough understanding of the nature and circumstances of past conflicts, and of past adversaries and allies. Effective American strategists, like strategists from any nation, must always endeavor to understand accurately the situation they face.

¹ General Carl Spaatz, "Strategic Air Power: Fulfillment of a Concept," *Foreign Affairs*, April 1946, 385.

There are many factors which *might* have drastically altered the outcome of the Second World War. Had the Axis powers been able to undertake conventional strategic bombing campaigns, this would not by itself likely have changed the outcome. More fundamental issues such as grand strategy, economics, culture, and industrial capacity were much more powerful determiners of the course of the Second World War.

Spaatz's motivation to write what he did is difficult to separate from the historical context of attempting to create an independent United States Air Force. It is difficult to imagine his taking a different approach in his article. The political and military culture of his day seemed to require proof that would gain entrance to the temple of independence--the special key called "decisiveness."

His closing paragraph is also very telling: "Another war, however distant in the future, would probably be decided by some form of air power before the surface forces were able to make contact with the enemy in major battles. This is the supreme military lesson of our period of history."² Indeed, in subsequent decades there were conflicts in which airpower continued to play a momentous role. However, Spaatz's conclusion that this is the *supreme* lesson is an example of viewing the world through a narrow aperture, likely intended to achieve an institutional goal. It also potentially misses the most important lessons for the future.

The point of this study is to provide insight into a perspective missing from the tool kit of many US airmen. It examines what occurred on the Eastern Front during the Second World War and how vital those events were to eventual Allied victory. Airpower is part of that story—but the airpower lessons of that theater are significantly different from those gleaned in Western Europe. The lessons of airpower on the Eastern Front should be very familiar to students of airpower who desire to most

² Spaatz, "Strategic Air Power: Fulfillment of a Concept," 396.

effectively contribute to joint campaigns in the future. Discussion of land battle includes rich examples of modern and ancient, western and eastern, approaches to warfare. Why should airpower not also draw from a diversity of experiences? Why should Eastern Front airpower lessons remain undiscovered? Is it possible that USAF thinkers tend to ignore the Eastern Front airpower experience simply because it seems to emphasize direct support for ground forces?

The first chapter will provide background, both cultural and military, which influenced the development of national, economic, land, and airpower in both the Soviet Union and Germany. The second chapter will refine the situation for both nations as the German invasion of the USSR, Operation Barbarossa, drew near. The third chapter attempts to capture salient airpower lessons from this campaign. It is critical for airmen to appreciate the possibility that one of the lessons of this monumental campaign is that strategic airpower had little to do with its outcome. The fourth chapter will attempt the near-impossible: to distill the vast experiences of the Eastern Front into strategic lessons for airmen. Finally a conclusion will summarize the findings of this study and provide some useful recommendations for the airmen of today.

Chapter 1

Military and Airpower Development: the Interwar Years

You may not be interested in war, but war is very interested in you.

Leon Trotsky

Of the many contextual factors that influenced the development of warfare, and air warfare in particular, on the Eastern Front in World War II, four stand out as especially relevant. These factors are: ideology and the military; the conduct and nature of the First World War and Treaty of Versailles; Russo-German diplomatic agreements after the First World War; and the nature of Stalin and Hitler's military policies. These factors are important because German and Soviet strategy, operational concepts, types of airpower, and combat performance on the Eastern Front were each critically shaped by these background factors. The first of these factors is communist ideology.

Ideology and the Military

If nothing else positive can ever be said of Adolf Hitler and Joseph Stalin, they at least demonstrated a consistent devotion to their stated aims. With great difficulty, one contemplates the extent of the evil and barbaric cruelty these regimes inflicted upon innocent people. Over the course of two world wars, German and Soviet forces wrought enormous death, destruction, and brutality upon one another. Yet, in light of the savage history of animosity between Germany and the Soviet Union, it is ironic that one of the great influences upon Soviet identity flow from the ideas of a German: Karl Marx.

Communism

Karl Marx's ideology challenged the abuses he believed endemic to capitalism. Just as most myths contain some element of truth, the

attraction of Marxism-Leninism was based upon valid criticism and concerns about social and economic conditions. Marx warned of capitalism leading to imperialism, greed, economic injustice, and international tension. These concerns affected the broader European community at the close of the nineteenth century. Elements of several of his ideas have been sufficient to influence one of the great movements of history. Marx's ideas were unquestionably utopian. According to international relations theorist Edward Carr, they were, "...the product not of analysis, but of aspiration."¹ During the century and a quarter since Marx's death, the serious flaws² of his ideas have been aptly demonstrated, yet the appeal endures today.

Early revolutionary and communist leaders sought amelioration of economic injustice through adherence to Marx's ideology. It is interesting that these early revolutionaries remained strongly committed despite the fact that they readily anticipated a future wartime enemy consisting of an "economically superior capitalist coalition."³ These communists did not sufficiently consider the possibility that capitalism might produce economic strength sufficient to mitigate shortcomings of the capitalistic system. Some even suggest that Hitler's plans to dominate were inspired and enabled by capitalism.⁴ Thus, the attraction of communist or (more broadly) utopian ideals remained strong.

The utopian movement was strengthened by a variety of influences to include US President Woodrow Wilson's idealist belief in a "League of Nations," wide-spread millenarianism, advocacy of international police

¹ Edward Hallett Carr, *The Twenty Years' Crisis, 1919-1939: An Introduction to the Study of International Relations* (New York: Perennial, 2001), 7.

² Carr, *The Twenty Years' Crisis, 1919-1939: An Introduction to the Study of International Relations*, 4. Carr comments, "Marx's analysis was intended to alter, and did in fact alter, that attitude. In the process of analyzing the facts, Marx altered them."

³ Richard W. Harrison, *The Russian Way of War: Operational Art, 1904-1940* (Lawrence, KS: University Press of Kansas, 2001), 127.

⁴ Rolf-Dieter Müller and Gerd R. Ueberschär, *Hitler's War in the East, 1941-1945: A Critical Assessment*, trans. Bruce D. Little (New York, NY: Berghahn Books, 2002), 35.

forces, and various forms of collective security. The utopian ideal may not naturally agree with the military mind. Samuel Huntington identified Marxism as fundamentally contrary to his definition of the military mind because of the communist belief that man is basically good and rational. The Marxist believes institutions corrupt man.⁵ In retrospect, the decades following the Russian Revolution reveal significant efforts to restrain and punish “good” people who all exist under the influence of new revolutionary institutions. Despite the growth of communist and utopian ideas, according to Huntington, there was possibly a counterbalance in military institutions. Thus, the spirit of the age conspired to establish expectations disproportionate to mankind’s ability to fulfill them, thereby setting the stage for the brutality of the Eastern Front.

This disparity between desire and reality was also present in the revolutionary military created in the USSR after the Bolshevik revolution in 1917. Friedrich Engels believed that, “the emancipation of the proletariat...will have its own special expression in military affairs and will create its own special and new military method.”⁶ These revolutionary ideas were powerful, but more would be needed if Russian Revolutionaries desired to create an effective Red Army out of the old Tsarist Army. As author and analyst in the Soviet Army Studies Office at U.S. Army Command and General Staff College, Jacob W. Kipp, clearly states, “...revolutionary élan was no substitute for a proper understanding of military science or the effective application of military art.”⁷ Converting revolutionary ideal into viable military policy, doctrine, and security was clearly going to present an enormous challenge. It is

⁵ Samuel P. Huntington, *The Soldier and the State* (Cambridge, MA: Belknap Press of Harvard University Press, 1957), 92.

⁶ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 123.

⁷ Jacob W. Kipp, "Military Reform and the Red Army, 1918-1941," in *The Challenge of Change*, ed. Harold R. Winton and David R. Mets (Lincoln, NE: University of Nebraska Press, 2000), 124.

impossible to fully understand the state of the Soviet land and air forces in 1941 without consideration of this tension.

Russian Civil War

A second irony is that the same Bolsheviks who undermined military and civil authorities in order to seize power in 1917 now needed to maintain strong military forces to ensure their survival.⁸ The men of the Red Army were exhausted from three years of fighting in World War I and they still faced internal threats from the “reactionary” White Russian forces, despite Defense Commissar Leon Trotsky’s efforts establishing the Brest-Litovsk pact which ended hostilities between the USSR and Imperial Germany. During this period, invasions by western nations also posed an external threat. British and American soldiers landed at Murmansk and Archangel’sk, while French and British forces invaded Odessa, Crimea, and the Caucasus region. Additionally, Japanese and American forces spread westward from Vladivostok on the Russian Pacific coast. The fledgling communist movement was rightly concerned for its survival, and had to fight several early struggles and learn some valuable lessons.

Some of the lessons discovered during the Russian Civil War, 1918-1920, were more obvious than others. Lenin and Trotsky grasped the importance of mobility in the vast Russian spaces, and used railroads to carry out large scale troop movements to different fronts on a number of occasions throughout the war.⁹ In this early period in Soviet military history, the importance of depth and strategic reserves became evident, as did the key role of the Political Commissar in ensuring the loyalty and political reliability of soldiers and officers alike. Furthermore, manpower requirements required conscription and mandatory military service for many Soviet citizens. These measures would later pay

⁸ David M. Glantz and Jonathan M. House, *When Titans Clashed: How the Red Army Stopped Hitler* (Lawrence, KS: University Press of Kansas, 1995), 5.

⁹ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 5.

significant dividends to the Red Army as the war with Germany continued over several years. In general terms, numerous non-uniformed civilians had enough training to constitute a formidable fighting force once called to active duty. This fact—an essential ingredient of “total war”—was not sufficiently taken into account by the Germans during the Second World War. These measures enabled the Bolsheviks to eventually achieve a narrow victory in 1920.

The Russian military leadership learned additional important military lessons during this period. They grasped the importance of effective logistic capabilities when conducting military operations in vast areas defended by relatively few troops, a situation that demanded mobility and improved command and control.¹⁰ The Civil War experience also illuminated the dangers of pushing operations beyond the point of diminishing return.¹¹ Regarding the emphasis of maneuver, historian David Glantz points out, “The two keys to victory proved to be concentration of superior forces to overwhelm the enemy at a particular point, and then rapid maneuvers such as flank movements, penetrations, and encirclements to destroy the thinly spread enemy. The prerequisites for such maneuvers were a highly mobile offensive force... [That] produced a generation of officers who believed passionately in the value of mobility and maneuver and soon embraced mechanized forces as the weapon of choice.”¹² Unfortunately, the Soviets also developed a tendency to allow mistakes in execution to transform the scheme of maneuver into a battle of attrition, described as a “grinding slugfest.”¹³ Tension between the emphasis on annihilation and acceptance of attrition warfare was an enduring theme in Soviet military experience. The flexibility to conduct warfare under either mindset would both bless

¹⁰ Kipp, "Military Reform and the Red Army, 1918-1941," 123.

¹¹ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 118.

¹² Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 6.

¹³ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 104.

and curse the Soviet military in future conflicts. Again, the broad outlines of the 1941-1945 clash were beginning to emerge.

M.N. Tukhachevskii, the Operational Art, and Deep Battle

One of the most successful Soviet commanders of the Russian Civil War, and perhaps Soviet Russia's greatest military theorist, was M.N. Tukhachevskii. Tukhachevskii, along with theorist V.K. Triandafillov, concluded that modern armies were too resilient to be defeated by one cataclysmic battle. A series of smaller offensives would be required that would allow for rapid exploitation into the enemy's rear echelons. Additionally, victory in war was shown to require sustained economic and political mobilization, as well as military efforts.¹⁴ Their examination of these large scale maneuvers led in the 1920s to the development of an intermediate conceptual level of war known as "Operational Art."¹⁵ A former Tsarist officer, A.A. Svechen, described this concept as, "Tactics make the steps from which operational leaps are assembled, strategy points out the path."¹⁶ One of the essays studied at the Russian military academy was written by M. Bonch-Bruevich, which highlighted a very modern-sounding understanding of the components of an operational plan: "...mission statement, intelligence on enemy forces and their probable courses of action, information on the status of one's own forces, the specific missions of subordinate units, the structure of rear services, the organization of supply, and the support of the operation."¹⁷ By 1958, the Soviet literature defined operational art (*operativnoe iskusstvo*) in the following way:

A component part of military art, concerned with the elaboration of the theory and practice of preparing and conducting front and army operations of the different services of the armed forces. Operational art is the

¹⁴ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 127.

¹⁵ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 7.

¹⁶ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 8.

¹⁷ Kipp, "Military Reform and the Red Army, 1918-1941," 128.

connecting link between strategy and tactics. Proceeding from the demands of strategy, operational art determines the methods of preparing and conducting operations for the achievement of strategic goals and serves as the point of departure for tactics, which organizes the preparation and conduct of the combined arms battle in accordance with the operation's goals and tasks.¹⁸

Its basic elements are little different from those contained in the modern joint definition of operational art.

Tukhachevskii subjected his own ideas to critical scrutiny, and accordingly they evolved in light of experience. The disaster of trench warfare of World War I impacted many military thinkers of his generation. The trenches were indicative of a general reluctance and inability to maneuver. Thus, through the 1920s his ideas began to favor deep operations that would avoid these tendencies.¹⁹ Instead of a static, broad front, certain elements of front-line forces would have to maintain and preserve their position as a fixing force, while other elements lunged forward against a weak point in order to create penetration along a thrust line. Shock units, supported by robust artillery, would be applied at the weak point. The concept employed combined arms techniques, maneuver, and logistical support to enable penetration into the enemy's rear areas.

Tukhachevskii's ideas collectively became known as "Deep Battle." Deep Battle sought to inflict casualties upon the enemy's front-line forces, while also destroying or disrupting his reserves, supply and logistics, command and control, and staff functions from the rear. New and rapidly improving technological capabilities in tank and aircraft technologies enabled large and rapid battlefield movements. Tukhachevskii theorized that with sufficient reserves, exploitation to a

¹⁸ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 2.

¹⁹ Richard E. Simpkin and John Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii* (Washington: Brassey's Defence, 1987), 34.

depth of 100 km through highly concentrated attacks on the enemy's weak areas would be possible. Through speed and concentration, the attacking force would break into enemy rear areas and, "go straight for the enemy operational reserves in cooperation with aviation and airborne forces..."²⁰

Deep Battle's impact on an opposing force's moral strength could be significant. Attacking enemy concentrations in such a way as to create a shallow envelopment (just behind their front line) was believed to induce stress upon enemy soldiers fighting near the front lines. Likewise, deep strikes would have less immediate impact upon enemy front-line soldiers, but would likely cause stress and confusion in the minds of enemy commanders.²¹ Some theorists believed that careful planning of maneuver can achieve a battlefield effect disproportionate to the strength of the operation. Clearly, airpower theorists did not possess a monopoly on the concept of achieving strategic or morale effects upon the enemy leadership.

Tukhachevskii's contributions were important in two main ways. He laid a doctrinal and technical foundation for Soviet air, mechanized, and airborne forces, establishing large mobile ground forces and their logistical requirements. In one of Tukhachevskii's lectures, he stated, "The side which is not poised to destroy enemy air bases, to disrupt his railway system, to mobilize and concentrate strong airborne forces, and to act swiftly with mechanized formations- all in all to adopt this style of striking the enemy-will not be able to achieve the requisite strategic concentration and will lose the principal theatres of operations. The nation which, in this year of 1934, neglects to embark on a radical strengthening of its airpower will suddenly and unexpectedly find itself in

²⁰ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 47.

²¹ Basil Henry Liddell Hart, *Strategy* (New York, NY: Meridian, 1991), 331.

a menacing predicament.”²² These ideas are evident in his contribution to Soviet Field Service Regulations 1936 (PU-36).²³ According to PU-36, swift force application was very important, and airpower was an important component of the combined arms. The manual advocated strong tactical airpower, operational interdiction, strategic attack, aerial resupply, aerial reconnaissance, and the gaining of air superiority.²⁴

Second, Tukhachevskii was able to preserve his ideas and influence Soviet military thinking despite the politically uncertain and dangerous environment that existed under Stalin’s regime. He counterbalanced the ideas of leaders who fundamentally saw combat differently and encouraged the idea of consecutive operations.²⁵ The essence of Tukhachevskii’s ideas was belatedly applied with eventual resounding success to expel the German invaders.

Tukhachevskii’s appreciation for strategic attack was based upon its impact on fielded forces and their logistic and mobility requirements. As a committed Marxist, Tukhachevskii was keenly aware of the relationship between economic production and a nation’s war effort. Despite this, his recommendations for the use of airpower did not favor industrial web theories such as those associated with the US Air Corps Tactical School. In an era where many airpower enthusiasts were convinced of the efficacy of strategic bombing, Tukhachevskii’s views make for an interesting contrast.

Strategy of Denial

Tukhachevskii’s preference for attacking fielded forces and their immediate logistical requirements invites comparison to political scientist Robert Pape’s description of the coercive airpower strategy known as

²² Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 43.

²³ USSR, "Provisional Field Regulations For the Red Army (PU 36)," 1937 in FBIS [Foreign Broadcast Information Service] Report: *USSR Report Military Affairs*, JPRS-UMA-86-031, 12 June 1986, 34-36.

²⁴ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 168.

²⁵ Harrison, *The Russian Way of War: Operational Art, 1904-1940*, 168.

“denial.” Pape defines denial as the use of military force to attack the adversary’s military in order to prevent them from meeting their stated goals. In Pape’s words, “Denial strategies target the opponent’s military ability to achieve its territorial or other political objectives...denial campaigns focus on the target state’s military strategy.”²⁶ Pape also describes contrasting strategies of punishment, risk, and decapitation which attempt to inflict suffering on the civilian population, or remove the leadership. Favoring denial implies targeting enemy military forces while avoiding the wasteful and unproven expenditure of directing attack upon civilian population or its leaders. Although civilians were grossly mistreated during the Eastern campaign of 1941-1945, this flowed from cruelty, general lack of concern for civilians, or ideas of racial superiority. It did not necessarily reflect operational and tactical military leadership preferences for how one should best conduct warfare; therefore it should not be considered a punishment strategy per se.

Pape’s formal analysis did not look exhaustively into Soviet strategy, but it is interesting that he does see the Luftwaffe’s combined arms (Blitzkrieg) tactics, which share many elements of Deep Battle, as a denial strategy. The Luftwaffe’s early efforts in the Battle of Britain were most effective because their focus was on airfields, pilot reserves, and fighter direction systems—also clearly a type of denial strategy. However, German effectiveness in the Battle of Britain declined as a result of their decision to transition to a “punishment” strategy by attacking London and other British population centers. Likewise, Pape categorizes the German Blitzkrieg combined arms concept as “denial” because it directly targeted enemy military forces and capabilities. Pape’s thesis is that strategy of denial is usually the most effective air strategy for coercing an enemy, since it reflects a preference for attacking frontline forces and

²⁶ Robert A. Pape, *Bombing to Win: Air Power and Coercion in War* (Ithaca, NY: Cornell University Press, 1996), 19.

attempting to achieve a battlefield breakthrough.²⁷ Tukhachevskii echoed Pape's conclusion by stating, "As a rule destroying the enemy by breaking his morale is an impossible task, since any such demoralization would turn largely on the social condition of his country. Demoralization of the remnants of an enemy army is a consequence of the destruction of his crucial main forces. It is thus a factor not just to be taken account of, but to be exploited."²⁸ Thus denial, as approximated by 1930s Soviet thinkers, was a practical matter of what was the best expenditure of available force and resources. Another factor which was seen as critical to the efficient use of force through combined arms was the ability to exercise command and control.

Command, Control, and Communication

The improvements of tank mobility, aviation, and artillery made the battlefield of the interwar period more lethal and also more complicated. Tukhachevskii clearly emphasized the significance of increased surprise and speed. These evolutions necessitated fresh analysis of the resulting challenges to Soviet training as well as Command, Control, and Communications (C3) capabilities.²⁹ Perhaps just as profound as deep operations are to the area of operations, are the implications that efficient application of deep operations have at the conceptual level of C3. At one end of the C3 spectrum lies directive control (known to the Germans as *Auftragstaktik*) and at the other end of the spectrum lies attempt to control through detailed orders (*Befehlstaktik*). Allowing for directive control also requires highly trained forces as well as staff officers who can make independent, responsive, and wise decisions. "... [O]ne senses that Tukhachevskii and his elite colleagues from the Tsarist Army considered the Prussian type of directive control to be essential to the success of deep operations, but

²⁷ Pape, *Bombing to Win: Air Power and Coercion in War*, 57.

²⁸ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 86.

²⁹ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 165.

dared not come out and say so for fear of bringing the entire weight of military convention and political centralism down on their heads. A libertarian trend toward directive control may even have been a factor in the purge.”³⁰The operational concepts forged in this period were, therefore, products of their specific political and social context.

Aviation

Tukhachevskii’s thought extended into the third dimension. On observing events in the Spanish Civil War, Tukhachevskii stated, “Aviation continues to have an even greater effect on troop movements and logistics. Experience of the war in Spain show the level of casualties inflicted on ground troops by air attack and its effect on morale, if troops are not equipped and trained in air defense.”³¹ These thoughts echo his influence in chapter 5 of the Soviet “Field Service Regulations 1936” (PU-36) in which airpower is concisely described. In some ways, it sounds like it could have been extracted from modern USAF tactical airpower doctrine. Of the seventeen key operational functions listed in Air Force Doctrine Document 1, 17 November 2003, PU-36 includes eleven of the modern airpower functions.³² Several not included, such as air refueling, rotary-winged flight (CSAR), space, spacelift, and navigation and positioning (GPS), were not operational realities in Tukhachevskii’s day³³ or, like weather services, were most likely included in other organizations, such as the army. Thus, of the eleven modern airpower functions accessible to Tukhachevskii, ALL eleven modern USAF doctrinal airpower functions are listed in PU-36. Below are air-minded comments from chapter 5 of an English translation of PU-36:

³⁰ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 51.

³¹ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 163.

³² Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, 17 November 2003, iv.

³³ Simpkin and Erickson, *Deep Battle: The Brainchild of Marshal Tukhachevskii*, 199-202.

“116. Aviation is used to attack those targets which cannot be destroyed by the fire of infantry, artillery, and other branches.

To achieve optimum combat effectiveness, aviation must attack in great numbers of aircraft and its effects must be consolidated in time and against targets which are of the greatest tactical importance.

As a rule the troop commander gives the mission to the combat pilots for the duration of the entire operation, stating to what extent the operational capability must be used.

Depending on the situation, tasks for specific sorties can then be allocated while the battle is in progress.

The success of cooperation between air forces and ground forces must be secured by reliable technical communications, by establishing personal liaisons between the troop commander and the air force commanders.

The choice and preparation of landing strips and airfields, using ground force personnel and materiel, is a daily task of commanders and their staffs at all levels.

117. Combat aircraft have the following tasks:

- a. they prevent the approach of enemy troops to the battlefield and destroy them in the rear area troop assembly or army area;
- b. they serve in direct support of friendly troops by attacking the enemy in various phases of the combat operation;
- c. they disrupt enemy command and liaison by destroying headquarters, transmitting centers, and wires of telephone and radio network;
- d. they attack landing operations from the air or water (rivers) by destroying them at their initial positions, en route, during debarkation and action on friendly territory;
- e. they disrupt the functioning of rear services, prevent railroad shipments, destroy roads for motor vehicle transport, destroy supplies stored in depots, at railroad stations, etc.;
- f. they destroy enemy aviation at its airfields, destroy depots and air bases;
- g. they participate in the defense against approaching large enemy bomber formation.

118. Fighter aircraft are primarily dedicated to the destruction of all types of enemy aircraft in the air and on the ground.

Their tasks are the following:

- a. they destroy enemy aircraft in the air and on their bases;
- b. they protect friendly troops and immovable objects against air attacks;
- c. they destroy observation and barrage balloons;
- d. they provide cover for the assembly area of flying units, escort the flying units of the combat team as far as their range permit, and accompany them again once they have fulfilled their combat mission;
- e. if required, they provide photo reconnaissance and air support for the artillery.

In exceptional cases fighter aircraft can be used as follows:

- a. to attack ground troops at rest or on the move;
- b. to accomplish reconnaissance tasks for the benefit of ground commanders as well as air commanders.

119. Light bombers are used against the following types of targets:

- a. troop concentrations;
- b. command posts of the ground forces and message centers;
- c. supply depots
- d. road and rail transports
- e. enemy aviation on its air bases.

In addition, light bombers can be used for the following tasks: countermeasures against an aerial landing operation and participation in friendly air landing operations.

120. Army aviation is principally dedicated to support ground forces in combat. Its tasks are the following: reconnaissance, monitoring the battlefield, establishing liaison, escorting tanks, and artillery air support.

Liaison aviation has the following tasks:

- a. transmittal of orders to the troops and receipt of reports from the latter;
- b. maintaining liaison between different branches and services;
- c. monitoring the battlefield.³⁴

³⁴ USSR, "Provisional Field Regulations For the Red Army (PU 36)," 34-36.

Thus, PU-36 represents a fairly comprehensive representation of the use of airpower. As a whole, it reflects strong parallels to modern USAF doctrine. Despite the tactical emphasis of PU-36, it still contains elements of strategic attack. Furthermore, it is interesting to note that, in 1935 the Soviet Union had the largest bomber force in the world.³⁵ It was airpower writ large—not in only one of its many forms—that Tukhachevskii and his followers advocated.

Annihilation or Attrition?

Like nearly every innovative military thinker, Tukhachevskii had healthy disagreements with some of his contemporaries. One conflict that Tukhachevskii addressed was the relative merits of a strategy of attrition or a strategy of annihilation. A strategy of attrition wears “down an opponent morally and materially so that they abandon the struggle.”³⁶ Annihilation favors use of mobility and superior numbers to decide the conflict quickly and decisively.³⁷ Several of his influential colleagues were proponents of an attrition mindset. The Soviets had an enormous amount of land which could be traded for time, and a vast population which could provide the necessary manpower. Despite his emphasis on operational art, theorist A. A. Svechen argued for the attrition approach due to experience of the First World War, his view of the persistent revolutionary struggles of the Russian society, his belief that Soviet forces would not succeed using a decisive blow, and his perspective that being prepared for a war of attrition was a safer, more conservative, approach to national security.³⁸ Tukhachevskii appeared to favor a middle ground by strongly favoring the annihilation approach of his Deep Battle maneuvers.

³⁵ Von Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945* (Washington, DC: Smithsonian Institution Press, 1982), 47.

³⁶ James Kiras, *Special Operations and Strategy from World War II to the War on Terrorism* (New York, NY: Routledge, 2006), 66.

³⁷ Kiras, *Special Operations and Strategy from World War II to the War on Terrorism*, 65.

³⁸ Kipp, "Military Reform and the Red Army, 1918-1941," 143.

Deep Battle combined robust numerical depth, logistics support, and industrialization, whereas a force optimized for attrition might neglect logistical or support issues. In 1930, Tukhachevskii proposed strength figures of 20,000 artillery pieces, 180 million stockpiled rounds, 260 divisions, 50,000 vehicles in the mechanized force (8-12 thousand of them tanks), and 8000 airplanes.³⁹ These quantities indicated a clear appreciation of the geographic size of Soviet defensive responsibilities and the value of mass. Tukhachevskii was accordingly a critic of British armor theorists B.H. Liddell Hart and J.F.C. Fuller and importantly, according to Jacob Kipp, "...Tukhachevsky never fell into the trap of assuming that mechanization would negate mass war...." In 1931, Tukhachevsky said, "Let's imagine a war between Great Britain and the USA, a war, for example, which breaks out along the Canadian border. Both armies are mechanized, but the English have, let's say, Fuller's cadres of 18 divisions, and the US Army has 180 divisions. The first has 5,000 tanks and 3,000 aircraft, but the second has 50,000 tanks and 30,000 planes. The small English Army would be simply crushed. Is it not already clear that talk about small, but mobile, mechanized armies in major wars is a cock-and-bull story? Only frivolous people can take them seriously."⁴⁰

Thus, the Russian revolution and M.N. Tukhachevskii established a core foundation that contributed both to Soviet weakness and strength in the first half of the twentieth century. The radically inconsistent and incoherent perspective which attempted to ameliorate economic injustice only succeeded in trading one form of injustice for another by setting conditions for Stalin's rise to power. M.N. Tukhachevskii's theory of deep battle was very progressive, but would be frustrated prior to its full

³⁹ Kipp, "Military Reform and the Red Army, 1918-1941," 144.

⁴⁰ Kipp, "Military Reform and the Red Army, 1918-1941," 146.

implementation. Nevertheless, as will be shown later, Tukhachevskii's concepts were eventually recovered and successfully applied.

World War I and the Treaty of Versailles

The First World War was a defining moment for every nation involved. Memory of the carnage which ensued for very little movement upon the battlefield communicated a great deal to civilian and military strategists alike. Many falsely believed that it would be the end of war. Others, more pragmatically, were determined to find a better means of waging it. Airpower theorists were motivated by the desire to prevent any recurrence of such a tragedy in any future war.⁴¹

Character of the First World War

The emergence of a "security dilemma," in which defensive measures were perceived as demonstrating aggressive intent, in the years after 1895 helped trigger the First World War.⁴² The nations of World War I were economically interdependent and highly competitive.⁴³ French fortifications and her alliance with Russia meant that Germany could be faced with an extremely dangerous two-front war.⁴⁴ In response, Germany's Schlieffen Plan sought a quick knock-out blow against France prior to an effective Russian mobilization. In such an environment, mobilization itself was, unfortunately, perceived as an act of war. If one adversary prepared for war, its opponent was tempted to match it. According to Kenneth Waltz, "If Austro-Hungary marched, Germany had to follow; the dissolution of the Austro-Hungarian Empire would have left Germany alone in the middle of Europe. If France marched, Russia had to follow; a German victory over France would be a

⁴¹ Richard Muller, *The German Air War in Russia* (Baltimore, MD: Nautical & Aviation Pub. Co. of America, 1992), 8.

⁴² Robert Jervis, *Perception and Misperception in International Politics* (Princeton, NJ: Princeton University Press, 1976), 67.

⁴³ Kenneth N. Waltz, *Theory of International Politics* (Boston, MA: McGraw-Hill, 1979), 167.

⁴⁴ Alistair Horne, *The Price of Glory: Verdun 1916* (New York, NY: Penguin, 1993), 14.

defeat for Russia. And so it was all a vicious cycle.”⁴⁵ In this way, the international system tightly connected the destinies of the predominant powers of the First World War.

The character of First World War combat was different from that demonstrated in the conflicts of the nineteenth century. Historian Michael Howard reports, “Before 1870 deaths from sickness in armies normally surpassed death from enemy actions by a factor of about five to one. By 1918 this proportion had been reversed.”⁴⁶ The use of chemical weapons was one obvious contributor, as was German Chief of Staff Erich von Falkenhayn’s proposal that the Germans defeat the French at Verdun by “bleeding them white.”⁴⁷ Despite desires for millenarian improvements and hopes for preventing future wars, the collective loss of thirteen million dead⁴⁸ cast a long shadow over Europe’s memory. Despite the increases in lethality, Howard cautions that the First World War was not a uniform period of unyielding horror. Improvements in transportation allowed for rotation of troops away from the front at reasonable intervals. Advances in medicine and social institutions such as the International Red Cross improved circumstances for both prisoner and soldier. Some of these improvements led to important military, doctrinal, and strategy developments in the interwar period.

In World War One, Germany faced a two-front war until the Russian revolution in 1917. Given the obvious danger that such a situation posed, it may seem incredible that Germany would eventually choose to place itself in the same position during the Second World War. However, it should be remembered that because Germany feared such a development, it continually felt compelled to include the consideration of fighting an enemy on each border, since they feared a simultaneous

⁴⁵ Waltz, *Theory of International Politics*, 167.

⁴⁶ Michael Howard, *War in European History* (New York, NY: Oxford University Press, 2009), 116.

⁴⁷ Horne, *The Price of Glory: Verdun 1916*, 36.

⁴⁸ Howard, *War in European History*, 116.

attack by France and Russia (or Poland).⁴⁹ Thus, German strategists entertained the idea that the best course of action would be prepared to conduct a decisive sequential attack.⁵⁰ However, in order to make such a concept possible, Germany must be economically and logistically prepared for a longer conflict necessitated by sequential attack with finite resources, or it must be capable of striking prior to enemy mobilization.

The German General Staff therefore emphasized mobility, which made possible maneuvers such as envelopments, encirclements, and flank attacks. The commander of the postwar German Army, General Hans von Seeckt, saw motor vehicles as having the effect of improving battlefield mobility and offsetting the problem of insufficient numbers of troops. By 1916, German staff officers developed “Hutier” tactics which foreshadow the Blitzkrieg because they relied on massive, swift artillery barrages followed by the unexpected appearance of “Storm Troopers.”⁵¹ These infiltration tactics were far from satisfactory, since they would often result in infantry penetrations which were difficult to support. During the Second World War these tactics would eventually be finely honed. Yet no amount of tactical prowess can compensate for a lack of strategic preparedness.

New Equipment

The internal combustion engine brought about dramatically increased ground mobility, and also made airpower possible. The introduction of primitive tanks was a promising development, although initially their performance was better suited to the conditions of trench warfare.⁵² Similarly, airpower saw its first taste of combat in the First

⁴⁹ Barry Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars* (Ithaca, NY: Cornell University Press, 1984), 183.

⁵⁰ Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars*, 183.

⁵¹ Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars*, 190.

⁵² Howard, *War in European History*, 131.

World War. Starting with reconnaissance and artillery spotting, aircraft gradually improved both in performance and in armament. German air raids over London contributed to the assumption that the bomber would always get through, despite some successes by British air defenses. New technical capabilities combined with revulsion for the unnecessary loss of life which occurred during the war contributed to the growth of improved military concepts and doctrines. When Germany attacked France on 10 May, 1940, the columns of Panzers with massed dive bombers in support demonstrated clear evidence that the Germans had learned significant lessons during the struggles of trench warfare.⁵³

Treaty of Versailles

The Treaty of Versailles imposed upon Germany conditions which would eventually influence its national identity and grand strategy. In the interwar period, Germany was expected to pay reparations and was limited to a lightly armed force of merely 100,000 soldiers. The German Navy and Air Force were “virtually eliminated.”⁵⁴ Imposing these restrictions is an appropriate response to aggression; however the Germans did not uniformly believe that the war was a battlefield defeat. Some attributed their defeat to the myth that German politicians and traitors on the home front had betrayed the German military. Even the conditions of the Armistice involved trickery, some believed.⁵⁵ The victorious powers of World War I, especially France, were justifiably wary of the German threat. Thus, the Treaty of Versailles limited German weapons production, took German land, and caused Germany to experience a sense of vulnerability. Ironically, according to Robert Jervis, “The effect of such unyielding policy, however, was to make the

⁵³ Horne, *The Price of Glory: Verdun 1916*, 342.

⁵⁴ Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars*, 182.

⁵⁵ Jervis, *Perception and Misperception in International Politics*, 277.

Germans less willing to accept their new position and therefore to decrease France's long-run security.⁵⁶

Thus, due to its perceived state of vulnerability, post-Versailles Germany continued its emphasis on the offensive as a method of mitigating the challenges of the world environment, all the while attempting to circumvent the requirements of Versailles. European politics after World War One also exacerbated the German sense of vulnerability. France concluded collective security treaties with Germany's neighbors: Yugoslavia, Romania, Czechoslovakia, Poland, and Belgium. Furthermore, Poland ended up with German territory and sizeable strength due to the Treaty of Versailles.⁵⁷ While German civilian leaders pursued amelioration of some of Versailles stipulations, the military blatantly pursued illegal arrangements and agreements.

Soviet and German Agreements

Germany and the Soviet Union were natural geopolitical rivals. Their ideologies were in conflict, and thus they viewed the other with strong suspicion. Despite these tendencies, they concluded several important agreements. One agreement already discussed is the Brest-Litovsk pact which the new revolutionary thinkers of Russia hoped would extricate them from the tangle of World War I. Germany would benefit by ending its two-front war and gaining the luxury of transferring forces to the Western front. This agreement failed to result in long-term peace and foreshadowed future conflict between the Soviet Union and Germany.

After the First World War, secret Soviet-German military collaboration agreements associated with the 1922 Treaty of Rapallo were an attempt to advance both nations' strategic goals. In light of the restrictions applied by the Treaty of Versailles, the Germans provided

⁵⁶ Jervis, *Perception and Misperception in International Politics*, 67.

⁵⁷ Posen, *The Sources of Military Doctrine: France, Britain, and Germany Between the World Wars*, 182.

funds and technical support to the Soviet Union in exchange for the opportunity to test and produce forbidden military capabilities. This allowed some German flight training to continue at Russian facilities. Realistically, the quantity of such weapons and capability remained small, but the fact that progress continued was quite helpful to both sides. Between 1922 and 1933, fueled by mutual hostility toward Poland, both countries continued their technical cooperation efforts. They even exchanged observers for exercises. Despite natural opportunities resulting from this symbiotic relationship, German and Soviet doctrine developed independently.⁵⁸ Although both sides had something to gain, these agreements did not long survive Hitler's rise to power.

Once Adolf Hitler came to power in January of 1933, conflict with the Soviet Union loomed distantly on the horizon. The secret military agreements dissolved and both sides "fought" opposite each in the Spanish Civil War (1936-1939). The weak Soviet economy made the idea of major war for Stalin a daunting possibility. Hitler's racist ideology, anti-communist stance, and demand for land in central Europe presented a very threatening situation for Stalin who knew he lacked sufficient allies to counter the danger presented by Hitler. Stalin did not receive the support he wanted from France and Britain, and as a result, abandoned collective security in favor of dealing directly with Hitler. The result was the Molotov-Ribbentrop Pact.

German Foreign Minister Joachim von Ribbentrop and Soviet Commissar for Foreign Affairs V.I. Molotov finalized and announced this agreement on 24 August 1939. It was effectively a public mutual non-aggression promise but was actually an agreement to divide Eastern Europe between Germany and the Soviet Union. The immediate benefit of this agreement is that it eased concerns of both countries of having to

⁵⁸ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 7.

fight a two-front war and gave Stalin the sense of a buffer zone on his Western border by giving him dominant position over the Baltic areas and Eastern Poland. This assurance would reveal itself to be only fleeting. Despite the fact that they had agreed to divide Poland, the German conquest of Poland in September of 1939 was so swift that it induced "an unpleasant shock to Moscow."⁵⁹

Civilian Leadership's Relationship to the Military

Stalin's Purges and Disarray

In 1934, Stalin began a purge of any potential rivals in the Soviet government. The reason for this reign of terror is best explained by Stalin's excessive paranoia and intolerance of any rivals. For the first three years, as the purges focused on the senior ranks of the Party, the diplomatic corps, and other elites, they did not directly impact the Red Army. However, Stalin's experience as a political officer during the Russian civil war left him distrustful of professional military officers. Stalin blamed the military for setbacks during the Revolution. As Stalin consolidated power, he eventually arrested officers who served under Leon Trotsky, including Tukhachevskii. The Soviet commander was further tainted in Stalin's eyes by his extensive professional contacts with German officers.

Despite the fact that Tukhachevskii was a committed communist and faithful servant of the Soviet state, he was arrested on 27 May 1937. Stalin never required real evidence; trumped-up charges were sufficient to satisfy his fears and thirst for security. Kipp argues that Nazi infiltrators plotted to frame capable military leaders as Stalin's enemies.⁶⁰ Tukhachevskii had some minor blemishes such as his previous association with Trotsky, sizeable respect and influence, original thinking, and a 1920 military defeat during the Polish-Soviet

⁵⁹ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 16.

⁶⁰ Kipp, "Military Reform and the Red Army, 1918-1941," 150.

War.⁶¹ Finally, these charges could have been influenced by suspicion resulting from Tukhachevskii's Deep Battle perspective of command and control. These ideas required that military leaders be capable of independent thought. Stalin utilized court martial proceedings which determined Tukhachevskii to be either a Trotskyite or German spy and sentenced him to death.⁶² His death was announced on 12 June 1937.

Incredibly, of 75,000 to 80,000 Soviet officers, 30,000 were executed or imprisoned. According to Glantz, "They included three out of five marshals; all 11 deputy defense commissars; all commanders of military districts; the commanders and chiefs of staff of both the Navy and the Air Force; 14 of 16 army commanders; 60 of 67 corps commanders; 136 of 199 division commanders. Another 10,000 officers were dismissed from the service in disgrace."⁶³ Many of the condemned were only guilty of not owing their careers to Stalin. The purges continued until 1941.

Stalin destroyed the leadership and middle-management of his military precisely when tension was growing and war loomed on the horizon. Young officers in both ground and air arms who survived the purge were presented the opportunity to lead organizations well beyond their experience level. In one account, a major arrived at his new unit to discover that the "commander, political commissar, chief of staff, and all but one primary staff officer of the division had been arrested, leaving him as division commander, a position that called for at least three ranks higher and ten more years of experience than he possessed."⁶⁴ Leadership and military experience were not the only victims of this tragedy.

⁶¹ Kipp, "Military Reform and the Red Army, 1918-1941," 124.

⁶² Richard Overy, *Russia's War* (New York: Penguin Putnam, 1998), 28.

⁶³ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 16.

⁶⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 12.

In the 1930's a number of Soviet air force leaders were interested in the ideas of Douhet. There was special interest placed in heavy bombers, and the idea that heavy aircraft could achieve strategic significance through independent missions was widely discussed. According to a 1954 RAND study, "most of the adherents of this view fell in the Great Purge of 1937-1938."⁶⁵ This is significant because it partially explains why, as the threat of Hitler grew, Soviet airpower did not develop strategic airpower to the degree that tactical airpower was developed. In any event, the Red Air Force in 1941 suffered from the same leadership deficit as the rest of the armed forces. The war would prove a brutal crucible.

Early Testing of the Red Army

Fortunately for Stalin and the Allies, despite attempts to destroy Tukhachevskii's ideas, enough was preserved and sufficient officers who had been influenced by his theories survived the purge that they were eventually implemented.⁶⁶ The Soviet military was also afforded three opportunities to evaluate its performance and readiness before the Second World War. First was the Spanish Civil War of 1936-1939. The USSR backed the Republican government against General Francisco Franco's insurgents, who were supported by Nazi Germany and Fascist Italy. The Soviets discovered that they had communication problems with the Spanish, their tanks were insufficiently armored, and their armor outpaced the infantry which allowed dismounted enemy troops to defeat the Soviet tanks without interference from Soviet troops. According to Glantz, "In short, armor could not attack independently but had to be integrated with combined-arms functions."⁶⁷ The initial Soviet

⁶⁵ Raymond L. Garthoff, *Soviet Attitudes Toward Modern Air Power*, RAND Report P-603 (Santa Monica, CA: RAND, 29 November 1954), 4.

⁶⁶ Overy, *Russia's War*, 211.

⁶⁷ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 13.

performance was disappointing and required several more years to be corrected.

The second Soviet opportunity resulted from a 1938-1939 border dispute with Japan. The local Soviet commander was a brilliant disciple of Tukhachevskii's named G.K. Zhukov. Zhukov was able to amass 57,000 men, 498 tanks, and 385 armored cars without being detected by the Japanese. He was able to encircle and defeat the Japanese forces. The victory cost the Soviets 7,974 killed and 15,251 wounded as compared to the Japanese 61,000 killed, wounded, or captured.⁶⁸ This victory initiated Zhukov's fame, but more importantly had the strategic effect of convincing the Japanese not to underestimate the Soviets. Although the Soviets were compelled to conduct significant operations on their eastern border at various times, they were spared from the likelihood of a Japanese attack on their eastern border during the Second World War.

The Soviets also conducted a bungled invasion of Finland on 30 November 1939. This invasion was ill-planned and a tremendous embarrassment to Stalin.⁶⁹ Ultimately it resulted in a pyrrhic military victory while politically alienating the USSR from the League of Nations. It sounded a clear warning to Stalin of the true state of his military forces, while simultaneously demonstrating to Hitler that the present state of military preparedness of the Soviet Union was extremely poor. It also demonstrated to both Stalin and Hitler that Europe was reluctant to get involved.

On 17 September, the Soviets also crossed into Poland. As meager as this effort was, the required logistics taxed the Soviets. Motorized units had to resort to fuel siphoning in order to keep moving. Polish resistance forces were also a difficult problem for Soviet leaders. As a

⁶⁸ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 14.

⁶⁹ Overy, *Russia's War*, 56.

foreshadowing of the cruelty and atrocities to come, Soviet forces massacred 14,500 Polish military officers and civilians at Katyn.⁷⁰

When these initial major movements were complete, the Soviets had essentially completed execution of the Molotov-Ribbentrop Pact. They had annexed the Baltic States, parts of Moldova, and Romanian objectives near German oil interests. Stalin's response to some of his military failures was to return to the technique of scapegoating. In fact, to a large degree, it was Stalin's earlier purges of his military that had left his forces in the dilapidated shape they were in.

Thus, on the eve of the Second World War, the Red Army was in utter disarray. It was confused both tactically and operationally, had few leaders capable of dealing with the challenges which lay ahead, and did not have the agrarian, industrial or economic strength its potential suggested. Furthermore, Stalin's leadership instilled institutional barriers to success which would ultimately contribute to an extremely dire situation for the Soviet Union.

⁷⁰ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 18.

Chapter 2

Lead Up to the Greatest Air-Land Battle in History

The German Army in fighting Russia is like an elephant attacking a host of ants. The elephant will kill thousands, perhaps millions, of ants, but in the end their numbers will overcome him, and he will be eaten to the bone.

Colonel Bernd von Kleist

The campaign fought between Germany and the Soviet Union was much more significant to the outcome of World War II and subsequent world events than many US airmen understand. To some, the Second World War was about D-Day, the Combined Bomber Offensive, island hopping, naval battles, and atomic weapons. This perspective is much too narrow and reflects ignorance on many levels. Significant lessons concerning the development of strategy, the importance of logistics, and airpower's success and failure in contributing to overall theater and national objectives are ripe and ready to be picked. The following chapter builds upon the historical context of both Germany and the Soviet Union which molded those nations and influenced their training, preparation, and doctrine and caused them to fight in the manner they did during the early days of the Second World War. This chapter offers a brief synopsis of what was occurring in both nations prior to 22 June, 1941, when Germany's invasion of Russia, Operation Barbarossa, began. This discussion will include a consideration of terrain, population demographics, the German army and airpower orders of battle, the Soviet army and airpower orders of battle, and finally it will communicate several considerations related to military aircraft production capacity and its relationship to the strategy and operational art applied in this campaign.

TERRAIN AND CLIMATE

The sheer size, diversity, and climatic extremes of the geography of European Russia warrant significant attention, as they powerfully influenced not only surface actions, but aerial activity as well. Both German and Soviet forces experienced the combined effect of terrain and climate, but it did not have an identical effect on each belligerent. For obvious reasons, the Russians were accustomed to the environmental challenges. As Napoleon's Army had famously experienced, European Russia could rapidly become a very unforgiving battleground. In vain, Hitler hoped to avoid Napoleon's error by conducting a short, successful campaign.

Some postwar German military observations of the influence of terrain and environment upon German operations were translated and published as US Army Pamphlet No. 20-231, published in 1951 (originally as a RESTRICTED document.) Formulated as a Cold War resource for American forces, it described the terrain and weather impact upon German combat operations in European Russia, through the eyes of German commanders who had experienced it.

The forests and swamps which confronted Hitler's forces were practically featureless and nearly impassable.¹ Principles of forestry were unknown in the Soviet Union and therefore the overgrowth, which hindered aerial reconnaissance, was very dense and rarely disturbed. The main rivers in Russia are predominantly oriented north-south which complicates east-west travel. Likewise, lines of communication were very rarely oriented east or west. Many of the roads served to connect villages and did not travel in convenient directions. Furthermore, many of the roads were unimproved dirt or logging tracks which inclement weather would quickly render impassable. The bridges were of indeterminate strength and reliability to support crossing by heavy military equipment.

¹ Department of the Army Pamphlet No 20-231, *Combat in Russian Forests and Swamps* (Washington: Dept. of the Army, 1951), 1.

German forces had to estimate load-bearing capacity very cautiously, especially under conditions of significant rain or pressures caused by ice floes.² Furthermore, even when inland rivers traveled in a useful direction, they were insufficiently monitored to keep them safely navigable.

At the start of Operation Barbarossa, the western edge of the battle space confronting the German military was initially divided by the massive Pripet Marshes into a northern and southern zone. There were significant geographic impediments to rapid long-distance movement in the form of the Bug, Dnieper, Donets, Don, and Volga Rivers. These rivers often required acceptance of increased risk and vulnerability to attack while river crossing operations were on-going. There were also seasonal factors such as torrential rain and extreme cold weather. A mixture of forested hills and seemingly endless plains continued to the East. During combat operations, German officers commented that the seemingly infinite nature of the landscape had a deleterious effect upon morale. No matter how successfully they campaigned, Russia seemed to grow in depth.

Forests provided enough cover to assist the growth of partisan bands. Much of the frontier facing the Germans to the east contained insufficient rail and road access which they initially hoped to use to their advantage. The distant Urals marked the far boundary of likely combat options. The southern edge of the battle space was lined by the Black Sea and Caucasus Mountains while the northern edge was characterized by the low-lands adjacent to the Baltic Sea and Scandinavia. The enormity of difference in latitude between the southern and northern extremes of the combat zone would mean that logistic, maintenance, food, and clothing requirements at any one time would necessitate

² Department of the Army Pamphlet No 20-231, *Combat in Russian Forests and Swamps* (Washington: Dept. of the Army, 1951), 1.

simultaneous provisioning for both warm and moist and cold and dry conditions.

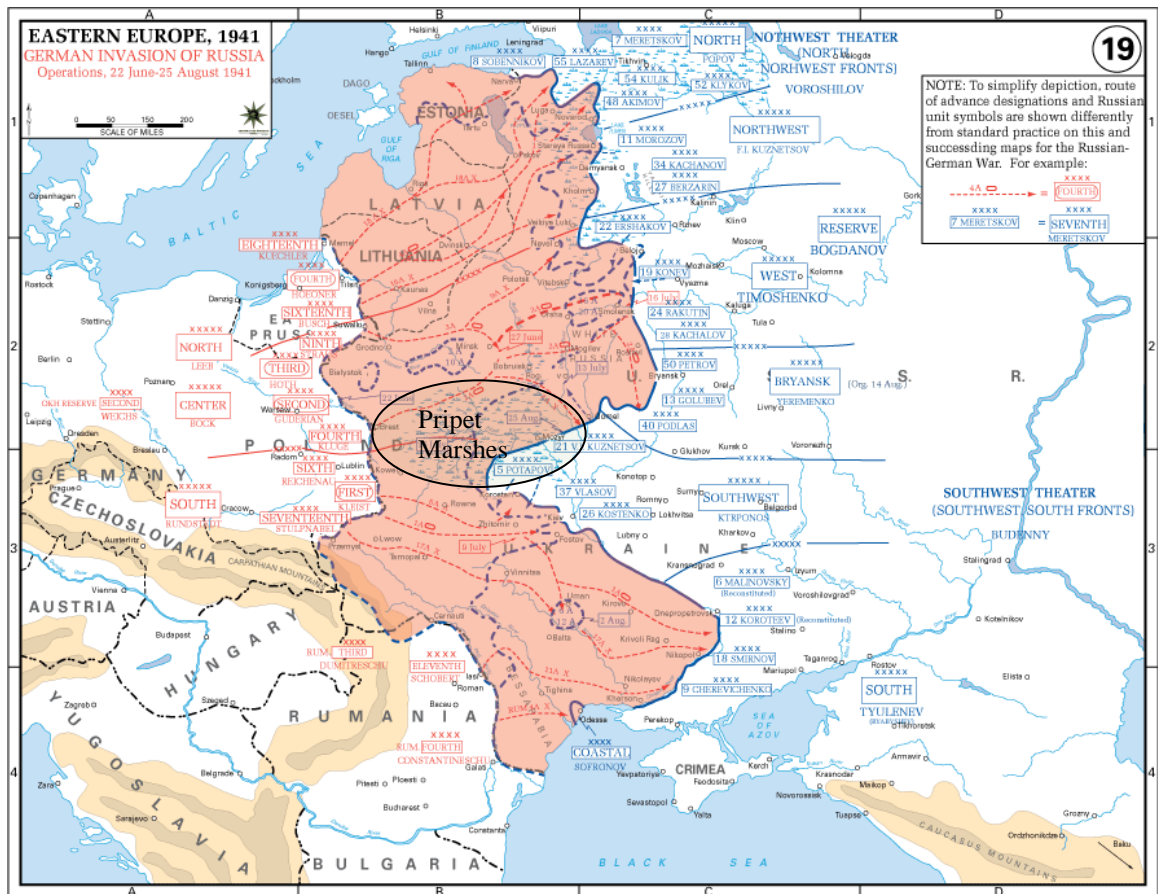


Fig. 1. Early Stages of Operation Barbarossa

Source: *West Point Atlas for the Second World War*, plate 19.

The Pripet marshes (see Figure 1) exemplify the remarkable diversity of terrain. In some ways, this area was militarily useful because it remained more accessible than some of the thicker forests. During cold weather, the marshes might allow for greater efficiency in travel. As a terrain feature, the Pripet marshes dominated the minds of many soldiers concerned about the effect it might have upon their tactics.³

³ Department of the Army Pamphlet No 20-231, *Combat in Russian Forests and Swamps* (Washington: Dept. of the Army, 1951), 3.

Seasonal climate change was another significant factor. The Russian winter months were especially brutal. Temperatures south of Leningrad would routinely be -40 degrees Fahrenheit, and in a mild winter might be as warm as -20 degrees Fahrenheit.⁴ For example, in January 1942, a single panzer division suffered up to 800 frostbite casualties each day.⁵ The capture of a Russian-style fur hat might be a welcome addition to German cold-weather gear except for the risk of being mistakenly shot by friendly forces.⁶ Cold weather, as long as the roads were not too icy, would enhance mobility over marshy or otherwise muddy terrain. However, the cold would also tend to render lubricants and grease ineffective, further complicating mobility. Delicate aviation technology was especially susceptible.

German tactics favored quick and agile infantry movements which were supported by artillery and Luftwaffe operations. Due to winter conditions, they could no longer reap the benefit of rapid gains after artillery preparation of their objective. Deep snow alone could effectively immobilize infantry units. In the winter 1941 attack on Tikhvin, the Germans suffered more casualties due to cold than to enemy action.⁷ It is no surprise that despite the predominance of specialized machinery and high technology of German equipment, the horse was sometimes a very important tool. However, even a horse in the open would freeze to death at temperatures as warm as -4 degrees Fahrenheit. In contrast, Russian troops, especially those stationed in Siberia, were outfitted with white clothing, skis, and cold-resistant equipment. They were not as hampered by climactic challenges.

⁴ Department of the Army Pamphlet No 20-291, *Effects of Climate on Combat in European Russia* (Washington: Dept. of the Army, 1952), 3.

⁵ Department of the Army Pamphlet No 20-291, *Effects of Climate on Combat in European Russia* (Washington: Dept. of the Army, 1952), 18.

⁶ Department of the Army Pamphlet No 20-291, *Effects of Climate on Combat in European Russia* (Washington: Dept. of the Army, 1952), 18.

⁷ Department of the Army Pamphlet No 20-291, *Effects of Climate on Combat in European Russia* (Washington: Dept. of the Army, 1952), 12.

The fact that Hitler disregarded careful study and awareness of these factors when considering the timing and wisdom of an invasion is well known. What is less appreciated is the impact that the weather had on aviation. Low ceilings and poor visibility affected both nations. Training and experience in how to conduct ground support at low altitudes and at shallow attack angles was helpful to any side that mastered it. Those skills would be helpful in conditions of low cloud ceilings which was common in this theater.

Weather impacts were not limited to the conduct of air operations. Of equal importance is the negative impact that the cold had on German aircraft servicing, maintenance, and expeditionary operations with long logistical and supply chains. During cold weather months, Soviet supporting maintenance functions were often conducted in suitable facilities. They were less affected by the predominant weather conditions. The Luftwaffe, which often found itself operating out of damaged or “bare” bases, was often unable to conduct operations at peak capacity due to the vulnerability of its equipment to the cold temperatures, or in some cases the clothing shortfalls that affected maintenance personnel.

Preparedness to conduct operations in diverse environments remains a critical requirement. An example is that long range aircraft are especially influenced by climactic changes because a sortie can originate in the warmth of the desert, and land in a very cold climate. Within a short period a single aircraft can be exposed to opposite extremes, as can necessary support equipment under the contemporary expeditionary mindset. Climatic equipment and process testing is just as important today.

POPULATION DEMOGRAPHICS

This conflict represented a significant existential threat to the Soviet people, given the clearly stated aims of German grand strategy. By extension, in the event of German military failure, the German people

would likely face an existential threat from an understandably vengeful Soviet Union. An understanding of population size and distribution is necessary in order to appreciate underlying factors that influence the ability to achieve grand strategic objectives.

At the beginning of 1941, the Soviet population (including areas of Soviet control such as the Baltic States and eastern Poland) was greater than 199 million. In contrast, Germany's population (excluding German-occupied Poland and Slovakia) was 100 million.⁸ The numerical disparity grows when age distribution is considered. 80% of Soviet males were under 20 years old. 60% of the German males were less than 40 years old.⁹ Granting Hitler's false assumptions of racial superiority, it is difficult to understand how Germany could overcome such a significant disparity in youthful manpower.

GERMAN SITUATION

On the eve of Operation Barbarossa, the German army had amassed a fighting force which dwarfs contemporary standards of warfare. At their disposal were 152 divisions, which included nineteen panzer (armor) and fifteen motorized infantry division. There were 3,350 tanks, 7,200 artillery pieces, and 2,770 aircraft. There were also fourteen Finnish divisions and fourteen Romanian brigades which supported German efforts. These forces were under the control of the German Army High Command (*Oberkommando des Heeres*, or OKH) and were subdivided into Army Group North, Center, and South. There was also an Army of Norway which was also called the Far North Army Group.¹⁰

The German air force, the Luftwaffe, was divided into self-contained *Luftflotten* (air fleets). *Luftflotten* are similar to an "Air Force"

⁸ Trevor N. Dupuy and Paul. Martell, *Great Battles on the Eastern Front: The Soviet-German War, 1941-1945* (Indianapolis, IN: Bobbs-Merrill, 1982), 2.

⁹ Dupuy and Martell, *Great Battles on the Eastern Front: The Soviet-German War, 1941-1945*, 3.

¹⁰ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 34.

within the United States Army Air Forces. Each *Luftflotten* contained various types of aircraft and was responsible for the different types of missions associated with those aircraft. They also included Anti-Aircraft (AA) and signals.¹¹ Each *Luftflotten* had at least one *Fliegerkorps* (air corps), which is the strength in which airpower was most commonly applied. As an example, the German southern sector was supported by Luftflotte 4, which was the parent organization to Fliegerkorps V which contained three bomber wings, one fighter wing, and associated communications, reconnaissance and transport aircraft.¹²

The *Fliegerkorps* were further broken down by aircraft and mission type. The *Geschwader* was one of the largest tactical formations and was comprised of 90-120 of like aircraft. Each *Geschwader* was composed of one or more *Gruppen* (30-40 aircraft) which would likewise be composed of several *Staffeln* (12-15 aircraft). Long-range bomber wings were called *Kampfgeschwader* and were outfitted with the Heinkel 111, Junkers 88, or Dornier 17 bombers (He 111, Ju 88, and Do 17, respectively). These were all two-engine bombers, and except for the Do 17(which later became the Do 217), were used throughout World War II. Dive-bombing units were called *Stukageschwader* and flew the Junkers Ju 87B. The *Jagdgeschwader* were fighter units and flew the Messerschmitt Bf 109E and F. *Zerstörer* units augmented the fighters with Messerschmitt Bf 110 twin-engined long-range fighter-bomber aircraft.¹³

Similar to USAF preference, the Luftwaffe preferred tactical formation was the 2-ship *Rotte* (pair) or the 4-ship *Schwarm*. These formations were intended to provide mutual support and flexibility. A *Staffel* was 3 *Schwarm* in a trail formation. The Luftwaffe that was available for the invasion of the Soviet Union consisted of the following:

29 1/3 *Gruppen*

¹¹ Muller, *The German Air War in Russia*, 31.

¹² Muller, *The German Air War in Russia*, 37.

¹³ Muller, *The German Air War in Russia*, 32.

9 1/3 dive bomber Gruppen,
20 fighter Gruppen
2 twin-engine fighter Gruppen
2 Ground-attack Gruppen
12 long-range reconnaissance Staffeln
5 air transport Gruppen
8 army liaison Staffeln

The combat strength of Luftwaffe aircraft was only 60-70% effective—a legacy of the hard campaigning in the months preceding Barbarossa. British postwar analysis concluded that Luftwaffe combat ready numbers were 2770 for the beginning of Operation Barbarossa.¹⁴ It is reasonable to conclude that the following data from a German General Staff report of 21 June 1941 is a useful account of the numbers of German aircraft available for Barbarossa:

¹⁴ Andrew Brookes, *Air War Over Russia* (Hersham, Surrey: Ian Allan, 2003), 37.

Table 1. German Aircraft Available for Operation Barbarossa

Type	Effective Strength	Combat Ready
Strategic Reconnaissance	61	39
Maritime/weather	168	125
Bombers	952	757
Dive Bombers	465	360
“Destroyers”	102	64
Fighters	965	735
Transports	292	175
Under Army Control		
Long-Range Reconnaissance	146	111
Short-Range Reconnaissance	416	358
Courier/liaison	107	91
Total	3674	2815

Source: Brookes, Air War over Russia, 37.

Although officially an independent service, some members of the Luftwaffe occasionally struggled with concerns about subjugation to army interest, particularly during a campaign that of necessity focused on ground maneuver.¹⁵ Luftwaffe personnel also feared that too much army influence might diminish their ability to concentrate on the air superiority or deep attack roles. Luftflotten and Fliegerkorps staffs retained full control of their long-range reconnaissance; tactical reconnaissance remained under the control of the army. Tactical reconnaissance units initially flew the Henschel 126 and later transitioned to the more capable Focke-Wulf FW 189.¹⁶

While the battles in France were still raging, Hitler was already engaging his staff about a campaign in the East. On 29 July, 1940, Hitler stated, “I will take action against this menace of the Soviet Union the moment our military position makes it at all possible...”¹⁷ In December of that year, Hitler issued Führer Directive 21 which directed

¹⁵ Muller, *The German Air War in Russia*, 67.

¹⁶ Muller, *The German Air War in Russia*, 32.

¹⁷ Alan Clark, *Barbarossa: The Russian-German Conflict, 1941-1945* (New York, NY: Quill, 1985), 24.

Operation Barbarossa. The objective of Barbarossa was to destroy Soviet military power in a rapid war of annihilation. Describing the role of the Luftwaffe, Directive 21 stated:

The Luftwaffe will make available for this Eastern campaign supporting forces of such strength that the army will be able to bring land operations to a speedy conclusion and Eastern Germany will be as little damaged as possible by enemy air attack.

The final objective of the operation is to erect a barrier against Asiatic Russia on the general line Volga-Archangel. The last surviving industrial areas of Russia in the Urals can then, if necessary, be eliminated by the air force.

It will be the Luftwaffe's duty to paralyze and eliminate the effectiveness of the Russian Air Force as far as possible. It will also support the main operations of the army, i.e. those of Army Group Centre and of the vital flank of Army Group South. Russian railways and bridges will either be destroyed or captured.

In order that we may concentrate all our strength against the enemy air force and for the immediate support of land operations, the Russian armaments industry will not be attacked during the main operations. Such attacks will be made only after the conclusion of mobile warfare, and they will be concentrated first on the Urals area.¹⁸

Andrew Brookes concisely summarizes Hitler's direction to the Luftwaffe, "Section IIIB of the Directive listed the goals of the Luftwaffe as (i) to eliminate Soviet air forces, (ii) to support German ground operation, (iii) to interrupt Soviet communications, and (iv) to provide paratroops and airborne personnel if the occasion should require."¹⁹

These instructions were quite straightforward. However, the Luftwaffe vacillated in providing whole-hearted obedience to Hitler's direction. Prior to the war, there were many Luftwaffe leaders that

¹⁸H.R. Trevor-Roper, ed., *Blitzkrieg to Defeat: Hitler's War Directives, 1939-1945* (New York, NY: Holt, Rinehart and Wilson, 1965), 49-53.

¹⁹ Brookes, *Air War Over Russia*, 17.

believed that “strategic” bombing was the chief mission of an air force.²⁰ They likely overestimated the potential for success in pursuing such a strategy. There were some that remained convinced of the viability of attacking enemy industry or transportation centers.

After the Spanish Civil War, there was some evidence in German reports that advocated avoiding the terror bombing of civilians. Luftwaffe officers were more aware of the challenges inherent in navigating to and attacking targets. According to one German military authority on the Spanish Civil War, Colonel Rudolf von Xylander, “bombing from the air failed to demoralize civilian populations.”²¹ Yet the possibility of launching attacks on cities remained in the background of Luftwaffe planning for the invasion.

German Ground Scheme of Maneuver

The German main effort was with Army Group Center which was commanded by Field Marshal Fedor von Bock. Army Group Center included the Fourth and Ninth Armies as well as Second and Third Panzer Groups. It was supported by Second Air Fleet (Field Marshal Albert Kesselring’s Luftflotte 2), with its subordinate II and VIII Air Corps (Fliegerkorps II and VIII). It is not surprising that Luftflotte 2 was particularly well equipped and influential, since it supported the major German thrust. Army Group North included Sixteenth Army, Eighteenth Army, and the Fourth Panzer Group. It was commanded by Field Marshall Wilhelm von Leeb. It included Generaloberst Hans Keller’s Luftflotte 1, with Fliegerkorps 1 and Fliegerführer Ostsee. Army Group South included Sixth Army, Eleventh Army, Seventeenth Army and both Third and Fourth Romanian Army. Army Group South was commanded

²⁰ Williamson Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945* (Maxwell Air Force Base, AL: Air University Press, 1983), 19.

²¹ Hilton Proctor Goss, *Civilian Morale Under Aerial Bombardment* (Maxwell Air Force Base, AL: Air University, 1948), 253.

by Field Marshal Gerd von Rundstedt.²² Army Group South was supported by Generaloberst Alexander Loehr's Luftflotte 4, containing Fliegerkorps V and IV. In all, the German army fielded 3,800,000 men.²³

German leaders, to include Hitler, involved in strategic and operational planning decisions were intellectually blinded by the recent stunning victories in Poland, Scandinavia, France, and the Balkans. Although efforts to bombard and eventually invade Britain had come to a disappointing close, the abandonment of the goal of occupying Britain did little to dampen German optimism. The German strategic mindset was conditioned toward continental wars. They prepared for and expected to achieve the rapid and dramatic envelopment and annihilation of enemy forces. Hitler's interest was in conducting a campaign primarily designed to destroy the Red Army, not capture specific geographic features. In fact, Hitler stated, "Moscow [is] of no great importance."²⁴ This certainty of guidance would wane and eventually result in much confusion among German planners. Not all German leaders were as confident. Heinz Guderian's near prophetic words before the war bespeak a clear and contrarian voice:

Russia possesses the strongest army in the world, numerically and in terms of the modernity of its weapons and equipment. The Russians have the world's largest air force as well, and they are striving to bring their navy up to the same level. The transport system is still inadequate, but they are working hard in that direction also. Russia has ample raw materials, and a mighty armaments industry has been set up in the depths of that vast empire. The time has passed when the Russians had no instinct for technology; we will have to reckon on the Russians being able to master and build their own machines, and with the fact that such a transformation in the Russians' fundamental mentality

²² Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 53.

²³ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 11.

²⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 53.

confronts us with the Eastern Question in a form more serious than ever before in history.²⁵

German Assumptions

German intelligence analysis accurately noted the poor state of Soviet military preparedness. Soviet military embarrassments in Poland and Finland were well known to German officials. Likewise, Stalin's purges ensured that members of the Soviet political and military leadership were either woefully inexperienced or blindly devoted to Stalin. Demonstrating leadership talent or genius was not necessarily a requirement for high command. Finally, assumptions about weak Soviet technology were woven together to portray Soviet industry in unfavorable terms. Despite these trends, the German assessment was actually correct in many ways, at least in the short term. The enormous tactical and operational successes that awaited the German advance testify that that German intelligence correctly apprehended the significant Soviet vulnerabilities.

Unfortunately for Germany, these assessments of Soviet vulnerability were combined with German preoccupation with Slavic biological inferiority. Not only were the Germans honed and ready for action, they were intellectually incapable of seriously considering a scenario other than rapid victory over their Soviet foes. Expert intelligence preparation does not end at appreciating initial strengths and weaknesses of the adversary. Rather, it starts here and transcends these qualities and endeavors to transition from mere apprehension to true comprehension of the enemy.

Contrary to postwar arguments which disparage Hitler's military judgment for considering a campaign to the east, it should be noted that Hitler actually understood very well that near the eve of Operation BARBAROSSA, Soviet military forces were probably at their weakest. In

²⁵ Heinz Guderian, *Achtung-Panzer!* (London: Arms and Armour, 1992), 153.

fact, Hitler knew that seizing the initiative and defeating the Soviet military would gain for Germany enormous quantities of war materials, slave labor, food, supplies, and significantly, a reprieve from the danger of an eventual attack from the east by a stronger, more dangerous Soviet army. Hitler was likely correct in believing that his chances for success were optimized by preventing the Soviets from beginning a conflict on the Eastern Front at the time of Stalin's choosing, especially if it was when Hitler least expected it. Luftwaffe assets were gradually and clandestinely moved at night from their positions on the Western front to positions of advantage to Germany's east. In fact, the last major London night raid, May 10, 1941, was partly a disguise for redeployment of German bombers to the east.²⁶

Hitler believed his Soviet enemy was sub-human, and would likely collapse under the pressure of a violent and disciplined German onslaught. Hitler explained to Rundstedt, "You have only to kick in the door and the whole rotten structure will come crashing down."²⁷ The only regard he had for its citizens was that they might fill the role of Helots²⁸ to glean the agricultural and natural resources Hitler needed to fulfill his goals. He did not fundamentally evaluate or appreciate the true nature of the enemy and the challenge he faced by choosing Operation Barbarossa as his course of action. Their experience with less-hardened Western forces dulled them to the martial and stoic nature of their Soviet adversaries. German General Heinz Guderian reveals that even Hitler grappled with the veracity of assumption of the enemy strengths, "If I had known that the figures for Russian tank strength...I would not – I

²⁶Great Britain Air Ministry, *The Rise and Fall of the German Air Force, 1933-1945* (London: Air Ministry 1948), 96.

²⁷ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 43.

²⁸ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 59.

believe – ever have started this war.”²⁹ Tank strength was not the only aspect that Hitler misjudged.

Although Hitler underrated Soviet character and fighting spirit, many German officers did not. One German officer’s assessment was that “The Russian soldier...loves a fight and scorns death.”³⁰ In fact, the fighting spirit of the Russian was displayed in the 1937 Soviet Field Service Regulations (PU 36). The first chapter, *General Principles*, states the following:

2. Red Army Combat Operations will always be oriented toward the annihilation of the enemy. Gaining a decisive victory and the total destruction of the enemy are the basic objectives in a war imposed upon the USSR.

The only means to gain that objective is combat. Combat results in:

- a. The destruction of the enemy’s animate forces and materiel;
- b. The impairment of his morale and ability to resist.

Any battle—offensive as well as defensive—has the goal of defeating the enemy. But only a resolute attack in the main direction of effort, which leads to irresistible pursuit, results in total destruction of enemy forces and materiel.

A constant urge to fight the enemy with the goal of defeating him, must be the basis of the training and conduct of any leader and soldier of the Red Army. The enemy must be attacked in a resolute and courageous manner wherever he is found, without specific orders being given to that effect.³¹

Soviet Marshal Nikolai Krylov echoes the strong Soviet martial culture and sentiment with his wartime exhortation, “If you are wounded, pretend to be dead; wait until the Germans come up; then select one of them and kill him! Kill him with gun, bayonet, or knife. Tear his throat with your teeth. Do not die without leaving behind you a

²⁹ Heinz Guderian, *Panzer Leader* (New York, NY: Dutton, 1952), 190.

³⁰ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 43.

³¹ USSR, “Provisional Field Regulations For the Red Army (PU 36),” 1937 in FBIS [Foreign Broadcast Information Service] Report: *USSR Report Military Affairs*, JPRS-UMA-86-031, 12 June 1986, 2.

German corpse.”³² The peril of misperceiving the reason and nature of a conflict or the nature of one’s enemy is one of Clausewitz’s key warnings.

Clausewitz could have been thinking of the type of ambition behind Operation Barbarossa when he warned that, “No one starts a war – or rather, no one in his senses ought to do so –without first being clear in his mind what he intends to achieve by that war and how he intends to conduct it.”³³ Clausewitz also warned, “Theory, therefore, demands that at the outset of a war its character and scope should be determined on the basis of the political probabilities.”³⁴ Hitler did not sufficiently consider the nature of the likely Soviet strategy. Hitler’s vision of the future of the Soviet state was so extreme that the Soviet mind must have perceived it as absolute, total, and existentially threatening. It signaled the necessity of a Soviet fight for national survival. Clausewitz further elaborated, “The degree of force that must be used against the enemy depends on the scale of political demands on either side.”³⁵ Thus, while the Germans’ tactical and operational prowess may have been up to the task, the state of their economy and grand strategy reflected gross misperception of the true situation they initiated.

Warfare, at least since the American Civil War, had clearly been a function of the combined performance of the battlefield and national industry.³⁶ Hitler’s reluctance to mobilize his industrial capability commensurate with the increased needs due to his chosen strategy is very difficult to explain. Some historians claim that these decisions sealed Germany’s fate prior to the campaign in the Soviet Union.³⁷ It is likely that his overconfidence was amplified by his meteoric rise to power

³² Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 43.

³³ Carl von Clausewitz, *On War*, trans. Michael Eliot Howard and Peter Paret (Princeton, NJ: Princeton University Press, 1976), 579.

³⁴ Clausewitz, *On War*, 584.

³⁵ Clausewitz, *On War*, 585.

³⁶ Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945*, 107.

³⁷ Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945*, 77.

within an economic framework still stifled by the depression. His intention to improve the plight of the post-Versailles German people was not easily reconcilable with harsh wartime rationing, government military spending, and overall societal deprivation that more clear thinking would have recommended as the prudent course of action. It is ironic, although not surprising based on lessons of history, that Hitler's ambition to directly pursue a shortcut to greatness for the Third Reich ultimately resulted in eternal shame and dishonor.

Despite possessing one of the world's most capable militaries, Hitler would eventually discover he was not conducting the kind of war he expected. Contrary to Clausewitz's warning, Hitler's decisions brought about the dilemma of risk: Fight immediately with a qualitative advantage, or delay at the risk of losing relative strength? Strategy rarely results in success when applied to a situation other than which it was designed. In this case, German weaknesses were exposed in the crucible of a protracted campaign in the East. However, Soviets weakness was apparent prior to the conflict; instead, it was Soviet strength that was revealed by the test of combat.

Blitzkrieg

It is commonly assumed that the German application of Blitzkrieg was the epitome of operational art. Their tactical capability was directed and shaped, through sound operational art, to meet the ends of their military and grand strategy objectives. Unfortunately for Germany, significant mistakes were made at the strategic level which resulted ultimately in failure.

Blitzkrieg's success in the opening period of the war in both France and Poland was stunning. It reflected German ability to conduct coordinated maneuver, identify and concentrate at appropriate points of weakness, penetrate deep into rear areas, and achieve positional advantage to further follow-on success in support of military and grand strategic objectives. German officers were satisfied with the result of

their tactics and did a good job hot-washing their results. There was little likelihood of deep self-criticism at levels above the operational, however. German Army Chief of the General Staff, Colonel-General Franz Halder, famously included in his diary, “I am not exaggerating when I say that the campaign against Russia was won within two weeks.”³⁸

However, there is also evidence that German military leadership failed to pursue interaction with Hitler, or was denied honest interaction concerning the relationship between military operations, strategy, and tactics. Their roles became that of managers of the conflict with little influence and connection in how they might enhance their ability to achieve the desired end state. Thus, controversy exists as to how serious the Wehrmacht was about operational art.

Mobile armor advocates, such as B.H. Liddell Hart and Heinz Guderian, possibly conducted a re-characterization of history. It is possible one of these two individuals introduced the phrase into popular language. In the editor’s introduction to Guderian’s *Achtung Panzer*, the claim is made that the term Blitzkrieg first appeared in *Time* magazine in 1939 as a journalist’s buzzword.³⁹

General Shimon Naveh, an Israeli student of operational art, suggests that, “The German Blitzkrieg concept is a typical historical myth.”⁴⁰ Naveh points out that the Wehrmacht officer corps did not have, “...a common cognitive denominator nor did it have any sort of corroborated operational conception. Its *raison d’être* was based on violent competition to achieve a tactical optimization of Hitler’s intentions by means of the pattern perceived as *Blitzkrieg*.”⁴¹ Naveh describes internal struggles to develop true operational art. However, Hitler

³⁸ Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory* (Portland, OR: Frank Cass, 1997), 107.

³⁹ Guderian, *Achtung-Panzer!*, 16.

⁴⁰ Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, 105.

⁴¹ Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory*, 115.

dominated and ultimately reserved strategic and operational planning to himself.

B.H. Liddell Hart's *The German Generals Talk* paints a picture of a mystical Hitler, discounting formal rules of strategy and allowing intuition to trump traditional strategy considerations.⁴² This comes from Liddell Hart's post-war interviews and could easily be tainted by the uncertain motives of his subjects. It seems that Hitler's behavior in conducting strategy seems to support this claim. Additionally, Hitler's leadership style did not encourage thoughtful analysis and critique. Public shame, false dossiers, and much worse were applied to subordinates as tools to ensure fear and devotion. Hitler kept subordinates in separate "water-tight" compartments⁴³ which assisted him in manipulating and controlling them.

Hitler was on some level gifted and insightful, but not truly the strategist he needed to be in order to safely reject the counsel of others. Furthermore, if Naveh is correct, the German military was not focused on operational art as the connective tissue between grand strategy and tactics. The German military excelled at tactics and, through *Blitzkrieg*, had perfected the high art of tactics. The military did not really master operational art, and was therefore unable to attempt to connect its good tactics to strategy.

Thus, Germany's status prior to Operation Barbarossa was that of a modern state possessing tremendous tactical and operational capability, but there was too little military influence upon military and grand strategy. They recently demonstrated enormous combat capability by achieving swift victories to the west and east. They were grossly lacking in strategic preparedness, manpower, level of industrial and economic output, and appreciation for the national strength of the Soviet

⁴² Basil Henry Liddell Hart, *The German Generals Talk* (New York, NY: William Morrow, 1948), 44.

⁴³ Liddell Hart, *The German Generals Talk*, 171.

Union. Their tactical excellence was not representative of the presence of robust conceptual connective tissue between tactics and strategy. Therefore, there was insufficient dialogue between military and political leadership concerning how good tactics would ultimately support strategy.

SOVIET SITUATION

The Soviet Union was incapable of successfully disguising its weaknesses. Awareness of Soviet weakness was widely understood even outside Germany. Even prominent Allied strategists also expected that a German attack upon the Soviet Union would likely result in complete Soviet defeat in very short order.⁴⁴ Despite these negative predictions, the Soviets were a formidable foe. The Red Army fielded an enormous 5.5 million man army.⁴⁵ Despite the less-than-brilliant results against Germany in the First World War, the Soviet Union enjoyed vast natural resources as well as a proven strategy of employing their vast real estate and available military capability to wear down and devour adversaries who were reckless enough to attempt to conquer them. Alan Clark describes the Soviet combination of tremendous manpower and space as the twin barrels of a gun on which Soviet leaders had been accustomed to rely.⁴⁶ Nevertheless, Soviet neighbors, including the Japanese, were tempted to test the waters.

Eruptions of conflict between the Soviets and their Japanese neighbors necessitated that the Soviets respect the military threat to their east. The Soviets stationed troops in the eastern regions as a deterrent. As a strategic consequence, Japan avoided causing Moscow further disruptions of great significance.

⁴⁴ Brookes, *Air War Over Russia*, 16.

⁴⁵ David M. Glantz, *Colossus Reborn: The Red Army at War, 1941-1943* (Lawrence, KS: University Press of Kansas, 2005), 6.

⁴⁶ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 631.

Nevertheless, Hitler was not the only actor concerned with the consequences of a two-front war. Thus Soviet strength consisted of reserves of troops and supplies which, at least from the perspective of proximity to German forces, were held very deep in reserve. Later in the Russo-German conflict, this would become more important once it became clear in Soviet thinking that Japan could no longer threaten them, and it became possible to move Soviet forces stationed in the eastern Soviet Union into battle against Germany. Soviet natural resources and land mass were not their only seemingly inexhaustible resource: so was the resolve of the Soviet people.

Morale and Bombing

Alan Clark describes the “mixture of horror and admiration” that descended upon German officers upon realizing the extent of suffering that Soviet soldiers were capable of enduring in silence. “They do not cry out, they do not groan, they do not curse. Undoubtedly there is something mysterious, something inscrutable, about their stern, stubborn silence.”⁴⁷ Clark concludes that, “The uneasy feeling that they were fighting something of almost supernatural strength and resilience was widespread among the German soldiers, particularly the infantry....”⁴⁸ Thus, the Soviet ability to endure suffering potentially invalidated common predictions about personal responses while under turmoil, stress, and deprivation. Advocates of civilian morale bombing were convinced that with enough pressure, society would demand that governments stop fighting.

The theory of morale bombing was that bomber aircraft could inflict sufficient influence upon the mind of civilian leaders to induce a change of policy. As a theoretical point, this may be valid. However, sufficient evidence exists that societies typically endure more suffering

⁴⁷ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 146.

⁴⁸ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 147.

than anticipated. Ultimately, the invading force can make no certain claims about when morale bombing will work. This is especially true when it involves a very resolute culture, such as the Soviet Union.

Not everyone was convinced of the reliability and predictability of directly influencing enemy morale as a coercive tool. A 1948 Air University report stated, "From the beginning, aerial warfare has been a war against men's minds as well as against their persons and their possessions. Up to 1939, the mind of man, though at times benumbed and uncertain, was not defeated by aerial bombardment."⁴⁹ Attempts at this type of coercion did not result in compelling support. This same report makes a similar point about the relative character of individual cultures by pointing out, "What [civilian morale bombing] did to the morale of the individual and to the national morale differed from country to country and from war to war."⁵⁰ Thus, military and national investment to produce enormous civilian destruction is a tenuous investment, at best.

Many theorists assume that morale bombing or the imposition of suffering on an enemy's population would bring about collapse or civil revolt and unrest. Sociologist Ted Robert Gurr describes the concept of "Relative deprivation (RD) ... [which] denote[s] the tension that develops from a discrepancy between the "ought" and the "is" of collective value satisfaction."⁵¹ Nazi society was susceptible to Gurr's "J-Curve hypothesis" which implies that revolutions are most likely when a prolonged period of positive development is followed by sharp decline.⁵² However, Soviet people lived with lower expectations (despite empty revolutionary promises of future prosperity), and therefore exhibited much more favorable character traits for a sustained war of attrition

⁴⁹ Goss, *Civilian Morale Under Aerial Bombardment*, 263.

⁵⁰ Goss, *Civilian Morale Under Aerial Bombardment*, 261.

⁵¹ Ted Robert Gurr, *Why Men Rebel* (Princeton, NJ: Princeton University Press, 1970), 23.

⁵² Gurr, *Why Men Rebel*, 52.

taking place on their own lands. Since the German military had enormously high expectations for the blessings that lay in their future due to their obedience to Hitler, they had a higher degree of RD and were thus, more likely to rebel or at least resist Hitler. Therefore, it is not surprising that Hitler faced numerous coup attempts.

The Soviet Air Force had some long range aviation and bombing capability, but morale bombing was not a high emphasis area. They understood that societies could endure tremendous levels of deprivation without giving up. They had lived under challenging conditions due to Stalin's leadership and were unlikely to think that other cultures would be easily affected by morale bombing. Instead, Soviet aviation decisions favored medium range bombers and tactical aviation. Although they did not directly target enemy morale, they did attempt to enhance tenacity and Soviet morale.

Red Army troops, prepared to defend their motherland to the death, were dispersed in depth such that only 2.7 million were at the front.⁵³ Recent military experiences revealed a combination of positive, but ultimately negative lessons about the precarious situation facing Stalin's military. They likely knew that in the event of German invasion, surrender would be a terrible choice. Soviet penal battalions or execution awaited those who made any unauthorized retreat or withdrawal. Thus, due to cultural reasons and the threat of punishment, the Red Army was prepared to be enormously steadfast in the face of a ferocious enemy.

Red Army Organization

Once the fighting began, the Soviet layout of its army was arranged by "Fronts," roughly equivalent to German Army Groups.⁵⁴ The Soviet military in 1941 lacked an organizational equivalent to the German

⁵³ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 135.

⁵⁴ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 631.

panzer group or panzer army that could facilitate deep penetrations into enemy territory.⁵⁵ Many Soviet divisions were undermanned at 8,000 even though their authorized strength was just under 14,500. Over time, this would evolve to the point that Soviet Fronts were reduced in size to be nearly equivalent to German field armies. Unfortunately, Stalin's purges had left the Red Army with a serious dearth of experience, leadership, doctrine, and tactical skill.

In peacetime, the Soviets were organized into military districts: Leningrad, Baltic, Western, and Kiev. These military districts were going to be converted to "fronts" once a conflict began. The Chief of the General Staff (Stavka) was General G. K. Zhukov, the third chief in eight months. These military districts were converted to the following Fronts:

Northern Front

Armies: 7th, 14th, 23^d

Corps: 1st and 10th

Northwestern

Army: 8th, 11th, 27th

Corps: 3^d and 12th Mechanized, 5th Airborne

Western Front

Army: 3^d, 4th, 10th, 13th

Corps: 6th, 11th, 13th, 14th, 17th, 20th Mechanized, 4th Airborne

Southwestern Front

Army: 5th, 6th, 12th, 26th

Corps: 4th, 8th, 9th, 15th, 16th, 19th, 22^d, & 24th Mechanized, 1st Airborne

Southern Front

Army: 9th, 18th, 2^d

Corps: 18th Mechanized, 3^d Airborne

Stavka Reserve.

Army: 16th, 19th, 20th, 21st, 22^d and 24th

Corps: 5th, 7th, 25th, and 26th Mech

⁵⁵ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 34.

Once Germany abruptly executed its portion of the Molotov-Ribbentrop pact by aggressively moving east into Poland, the Soviets likely felt compelled to step in and do the same, despite the fact that the Molotov-Ribbentrop specified their claim to the eastern third of the country. Nevertheless, the Soviet rapid expansion west into Poland, even though moderate in size and pace, stretched Soviet logistics capability and obligated Stalin to prematurely forward deploy his army and his air force (*Voyenno-vozdushnyye sily* or VVS) throughout these new areas to secure his claim. Thus, Stalin's forces were spread abroad and postured across new landscape, slightly too exposed for adequate protection.

This concept offers more satisfying explanatory power than to say Stalin lacked common sense in so deeply deploying valuable VVS assets. Stalin clearly expected to receive strategic warning through diplomatic channels and would not entertain discussion of the possibility of a surprise German attack, even when the evidence strongly supported the possibility. Thus VVS assets were positioned well within range of a German sneak attack.

Soviet Chief of the General Staff Marshal Georgi Zhukov consented to the idea of a "light screen" of occupation in the newly acquired Western lands to dissuade Germany from proceeding any further.⁵⁶ The Soviet preference for defensive belt arrangements contributed to a significant proportion of their army remaining in operational or strategic reserves which were outside the immediate reach of German forces. As early as February of 1941, 190 new airfields were ordered to be constructed in these western areas. The amount of VVS forces positioned close to German lines (5000 of 7000 aircraft)⁵⁷ was disproportionately high to have any lasting deterrent effect, since they were not sufficiently accompanied by army strength. Their lack of

⁵⁶ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 37.

⁵⁷ Dupuy and Martell, *Great Battles on the Eastern Front: The Soviet-German War, 1941-1945*, 8.

protection, inexperience, and vulnerability outweighed any increase in lethality afforded by their closer proximity to German forces. These circumstances may explain why the VVS was so vulnerable in the early period of the German onslaught, but it also explains how Soviet army forces were able to survive despite enormously successful German envelopment tactics. The German penetrations could not reach deep enough to threaten Soviet reserves.

Air Strength

Hardesty points out that Soviet air strength figures are difficult to determine with certainty, but a reasonable estimate is that the VVS had 8,000 to 10,000 aircraft.⁵⁸ Historian Kenneth Whiting favors 10,000,⁵⁹ and David Glantz's estimate fits within this range at 9,576, although he offers an unusual level of specificity and precision.⁶⁰ These are extraordinary quantities, but are potentially misleading. German intelligence estimated 12,000-14,000 Soviet aircraft but that only 4,000 were useable as "first class machines."⁶¹ Historian Richard Muller supports this claim by noting, "The entire new generation of Soviet combat aircraft that appeared in 1940-1941, including the Yak-1, MiG-3, Pe-2, and Il-2, was generally absent from intelligence estimates and recognition manuals prior to the invasion."⁶² These new machines were slowly arriving in combat units. Furthermore, over 80% of the VVS consisted of obsolete aircraft.

Both the VVS and Luftwaffe were afforded the opportunity to improve their capabilities as a result of difficulties experienced in combat during the Spanish Civil War. Both sides benefited from the opportunity to develop better engineering, techniques, and procedures. These

⁵⁸ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 17.

⁵⁹ Kenneth R. Whiting, *Soviet Air Power* (Maxwell AFB, AL: Air University Press, 1985), 12.

⁶⁰ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 37.

⁶¹ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 17.

⁶² Muller, *The German Air War in Russia*, 41.

benefits were realized in operations, maintenance, equipment and aircraft procurement decisions. Thus, both Soviet and German equipment enjoyed a dress rehearsal which allowed deep impressions to form about the efficacy of their current tactics and skills.

Soviet equipment was obsolete in many cases. Two very notable ground equipment exceptions were the successful Katyusha rocket launcher and the T-34 tank which had significant fire power, strong mobility, and sloping armor to deflect enemy rounds.⁶³ Soviet aircraft in the lead up to the German invasion were undergoing an extraordinary transition. The huge numbers of available machines, most notably the Polikarpov I-15 and I-16 fighters, often represented antiquated technology, to include open cockpits, wood construction, and externally braced wings. New models such as the MiG-3 were improvements on previous editions, while the new Il-2 *Sturmovik* was better than its Luftwaffe counterpart in some ways.⁶⁴

By June of 1941, the most modern and capable Soviet combat aircraft consisted of the following types and quantities:

Table 2. Soviet Combat Aircraft in June 1941

Type	Quantity
Yak-1	399
MiG-3	1309
LaGG-3	322
Pe-2	460
Il-2	249
Total	2739

Source: Von Hardesty, The Red Phoenix: The Rise of Soviet Air Power, 21.

⁶³ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 194.

⁶⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 37.

The transition from outdated aircraft to the new equipment was occurring at precisely the worst time for the Soviets. Stalinist paranoia demanded arrests for “sabotage” when in reality it was accidents that caused training losses. Additionally, many of the Soviet pilots had insufficient training time in their new aircraft.⁶⁵ Finally, risk of fratricide was great among Soviet fighters or air defense personnel due to lack of aircraft recognition training.⁶⁶ One Soviet pilot was angry because of the unnecessary potential for fratricide, “every day all the women in the marketplace at Kotovsk saw [new aircraft]” while noting that members of the same air division did not know that such a Soviet aircraft existed prior to seeing it in combat against the Luftwaffe.⁶⁷ Improvement in training and equipment is only as effective as the organizational and command structure allows.

Organization of the Soviet Air Force

Marshal S. K. Timoshenko held the post of People’s Commissar for Defense (until Stalin took assumed the post on 19 July 1941.) In 1940, Timoshenko conducted a massive VVS reorganization which established the following four categories of VVS command relationships:⁶⁸

1. Long-range Air Force of the High Command (5 long-range bomber aviation corps and 18th, 26th, and 30th Separate Long-Range Bomber Aviation Divisions.⁶⁹ Units would fly TB-7 bombers and Yak-1 or LaGG-3 fighters for protection. Squadrons had 5 bombers, regiments had 15 bombers and 10 fighters, division had 30 bombers and 20 fighters while Corps had 60 bombers and 40 fighters.)

⁶⁵ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 38.

⁶⁶ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 25.

⁶⁷ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 25.

⁶⁸ John T. Greenwood and Von Hardesty, "Soviet Air Forces in World War II," in *The Soviet Air Forces*, ed. Paul J. Murphy (Jefferson, NC: McFarland, 1984), 39.

⁶⁹ Glantz, *Colossus Reborn : The Red Army at War : 1941-1943*, 311.

2. Front Aviation. Air Forces of the Military District. Term Military district would later be replaced with "Front". The Front consisting of fighter division and short range bomber divisions. Consisted of 3 or 4 independent bomber, fighter, and mixed air divisions and regiments. 200-250 aircraft.
3. Army Aviation. Air Forces of the Combined Arms Army. Consisted of 1 or 2 composite air divisions attached directly to ground army to support combined arms and mechanized units on the battlefield.
4. Organic Aviation. Air squadrons subordinated to a corps, division, or lower level formation. "Ninety-five Organic Aviation squadrons, usually 10 reconnaissance/spotter aircraft and six liaison planes, were assigned directly to rifle, mechanized, and cavalry corps and came under the immediate operational control of the corps commander."⁷⁰
5. Reserve component of the High Command.

The corps, army, and front aviation units were all tactical and assigned to army units for direct and indirect support of ground operations. This was done to improve coordination. The long-range bombers were independent of the army. The dependent VVS represents a strong case study in contrast to the independent Luftwaffe, Royal Air Force (RAF), and (essentially independent) US Air Army Forces.⁷¹

Official Soviet accounts record strong appreciation for the role of airpower and the validity of combined effort by the various types of available forces. Soviet air doctrine indicated that independent formations served the purpose of destroying enemy air forces and annihilating ground targets. During ground offensives, Soviet airpower

⁷⁰ Greenwood and Hardesty, "Soviet Air Forces in World War II," 39.

⁷¹ During World War II, the US Army Air Forces was nominally part of the Army, but functioned independently for all practical purposes.

should focus on “seizure of control of the air; cooperation with the ground forces to break through the enemy’s tactical defense zone and to expand the operation in his immediate rear; protecting men and targets in our rear; striking against the enemy’s reserves; protecting landings and supporting airborne troops; and carrying out aerial reconnaissance.”⁷² John Greenwood and Von Hardesty listed three main VVS objectives: “(1) achieving air supremacy, both tactical and strategic; (2) supporting Army ground forces and Navy operations; and (3) performing air reconnaissance.”⁷³ This list appears consistent with the actions they took with their available assets; history would tell how seriously they meant it.

Soviet VVS fighter formations usually flew in tight formations of three aircraft.⁷⁴ Their defensive mindset and overly-tight formations were not likely to increase Soviet combat effectiveness, especially when opposed by looser, more flexible, and more aggressive Luftwaffe adversaries. German formation leaders reaped tactical advantage from offering their wingmen flexible formation position to maximize their ability to maintain mutual supportive visual search patterns and sufficient physical separation to allow for greater maneuvering without fear of collision. Soviet tendency to favor tighter formations decreased situational awareness, maneuverability, and responsiveness.

LEND-LEASE and AIRCRAFT PRODUCTION

The Soviet and German aircraft production figures⁷⁵ are listed below. These values are heuristic as they potentially contain a mixture of myth, bias, and wishful thinking. Additionally, these numbers do not reflect the impact of the US Lend-Lease program to the USSR. In total,

⁷² Ray Wagner, ed., *The Soviet Air Force in World War II*, Official USSR History Translated by Leland Fetzer (Garden City, NY: Doubleday, 1973), 20.

⁷³ Greenwood and Hardesty, "Soviet Air Forces in World War II," 40.

⁷⁴ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 25.

⁷⁵ Wagner, ed., *The Soviet Air Force in World War II*, 400.

the US delivered 14,018 aircraft and the British sent 4,313.⁷⁶ Types of aircraft involved included: P-39, P-40, P-47, P-63, A-20, B-25, B-24A, C-46, C47, O-52, AT-6, Hurricanes, Spitfire VB, and Spitfire IX.

Concerning Lend-Lease, Richard Overy notes that despite official Soviet history to the contrary, “Marshal Zhukov, in a bugged conversation in 1963 whose contents were released only thirty years later, endorsed the view that without aid the Soviet Union ‘could not have continued the war.’”⁷⁷

Aircraft manufacturing figures are listed below:

Table 3. Soviet and German Aircraft Production 1938-1945

Year	Soviet	German
1938	5469	5235
1939	10382	8295
1940	10565	10826
1941	15735	12401
1942	25436	15409
1943	34900	24807
1944	40300	40593
1945 (to June)	20900	7540

Source: The Soviet Air Force In World War II, ed. Ray Wagner, 400.

Stalin’s industries were in disarray. Much work was underway to modernize their efforts. By the spring of 1941, much progress had been made. In 1940 the Soviets had produced less than 100 modern aircraft in 1940, but they produced 2,600 in the first half of 1941.⁷⁸ This is great progress on behalf of Soviet industry, especially with the perspective that despite German engineering excellence, the Ju 88 was designed with 4,000 different screws and bolts, and needed to be hand-riveted!⁷⁹ It is also significant that Soviet efforts to relocate and retool their factories took significant effort and temporarily reduced their short-term

⁷⁶ Wagner, ed., *The Soviet Air Force in World War II*, 398.

⁷⁷ Overy, *Russia's War*, 195.

⁷⁸ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 20.

⁷⁹ Brookes, *Air War Over Russia*, 12.

production numbers. This was an important strategic investment which reaped much improved production numbers in later years.⁸⁰

Conclusion

On the eve of the German campaign against the Soviet Union, the German military represented the world's most capable fighting force for the conduct of rapid maneuver warfare, envelopment, and annihilation, but it possessed a level of resources far beneath the level of its ambition. The grand and military strategy therefore faced grave risk of failure. The only way they could win was to stand ready with a massive combined arms force ready for a battle that would be violent, decisive, and quick.

In contrast, the Soviet military was none of these things. It struggled under Stalin's self-imposed challenges as well as growing pains common to many emerging great powers. Blessed with natural resources and a protected productive capacity, the Soviet forces had some advantage of the natural strength of the defensive as well as battle upon familiar terrain and climate. However, their key strength was their ability to trade both distance and human blood for the much needed time Stalin required to save the Soviet nation. It must be understood that this conflict was the hinge upon which the Second World War would be decided.

⁸⁰ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 57.

Chapter 3

Air Battle on the Eastern Front

*The art of air combat is clearly a German privilege.
Slavs would never be able to master it.*

--Adolf Hitler

The campaign between Germany and the Soviet Union had enormous significance at the grand strategic, military strategic and operational levels of war, for both ground and air forces. In order to comprehend the airpower lessons emerging from this theater, a brief synopsis of the overall campaign is required in order to establish the necessary context. The Eastern Front was a unique theater, and the forms of airpower applied by both adversaries were peculiar to that theater. In particular, the Eastern Front suggests a different definition of “independent” airpower than existed on, for example, the Western Front. Finally, the remainder of the chapter will consider some of the major airpower roles and missions—air superiority, air-ground integration, and interdiction—that seem to offer especially valuable insights.

The Russo-German war lasted from 22 June 1941 to 9 May 1945. The duration, geography, distance, cost, and patterns of conflict are difficult to comprehend. Thus, historians vary in how they divide the conflict conceptually and chronologically, especially in precisely identifying the turning points of the campaign. For purposes of this study, the campaign will be viewed in accordance with the traditional Soviet perspective on the conflict. The Soviets understandably refer to the conflict on the Eastern Front as the Great Patriotic War. The first period stretches from the beginning of Operation Barbarossa, 22 June 1941, until the opening of the battle for Stalingrad (19 November 1942). The second period is from Stalingrad (19 November 1942) to the aftermath of the Battle of Kursk (December 1943), the final period is from December 1943 until the final Allied victory over Germany (9 May 1945).

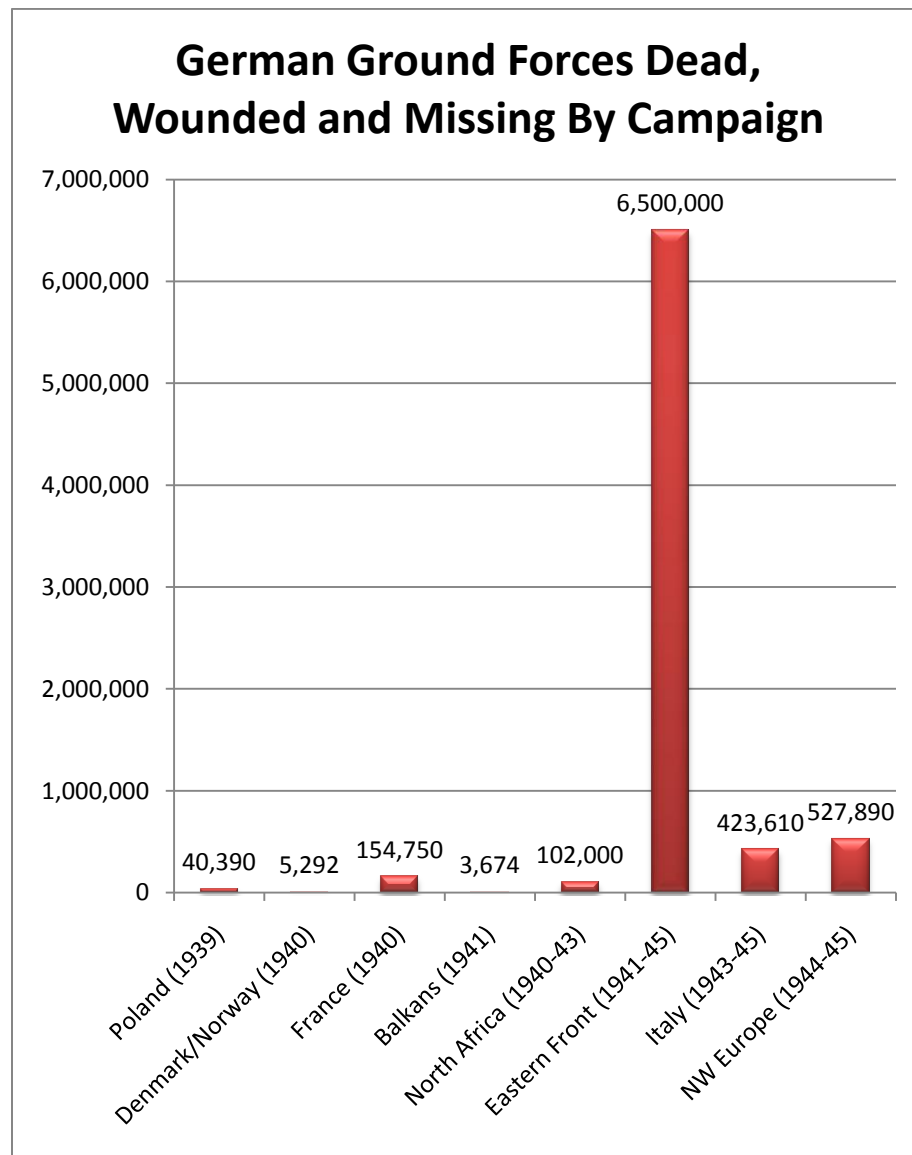
Overview of the Great Patriotic War

The Eastern Front was of enormous significance to the outcome of the Second World War. The simplest way to demonstrate this at a macro-level is to compare the numbers of casualties inflicted upon German ground forces on the Eastern Front to the casualties they suffered in other Second World War theaters.

Numbers alone cannot tell the full story. For example, casualties due to cold or disease may indicate unwise strategic choices on Hitler's part and may not necessarily indicate Red Army combat capability. Furthermore, the eastern war featured several fundamental points of advance, culmination, and decision. Viewing the entire campaign as simply a matter of German casualties masks the fact that German success was so overwhelming in the opening months of the war. It is likely that the bulk of the German losses occurred closer to the end of the war, when the German Army was at its weakest and in disarray. These analytical pitfalls are common to statistics and could apply to any of the theaters to some degree.

Allied action in the Pacific, North Africa, and Western Europe did significant damage to the Nazi war machine, but fell far short of inflicting the casualties upon German forces that the Red Army produced. Table 2 demonstrates the magnitude of the combined effect of the Red Army, distance, climate, and cultural tenacity upon the German military. This chart also helps to understand the consternation and suspicion Stalin exhibited as he waited for the allies to commence an invasion of the West (the Allied D-Day invasion). His forces were engaged to the death, while he imagined, wrongly, that Allied forces were taking their time to enter the fight.

Table 4. Comparison of Campaign impact on German Ground Forces



Source: Chris McNab, *The Third Reich 1933-1945*, 135.

The Eastern Front is known as the “Great Patriotic War” for very good reasons. On Victory Day, 9 May 1990, Mikhail Gorbachev recited a powerful Soviet sentiment about Soviet sacrifice in the Second World War. He said, “No one is forgotten, nothing is forgotten...” The Soviet cost in terms of human life was beyond comprehension. Richard Overy summarized the Soviet human cost:

Stalin's empire was won with reservoirs of Soviet blood. The cost of the war dwarfed the sacrifices of any other fighting powers. By the time the last salvo had been delivered in Manchuria, Soviet forces alone had casualties of over 29 million: 6.2 million killed, over 15 million wounded, 4.4 million captured or missing, 3-4 million incapacitated by illness or frostbite. Of the 34.5 million men and women mobilized an incredible 84 per cent were killed, wounded or captured. Total military deaths from all causes are given as 8.6 million...total Soviet war dead may have been as high as 25 million, one quarter higher than the official figure of 20 million announced by Khrushchev in 1956, but consistent with the numbers publically declared by Mikhail Gorbachev in 1991.¹

First Phase of War: 22 June 1941 to 18 November 1942

The first period began with the German invasion, 22 June 1941, and continued until November 1942. During this time, the Germans were able to achieve amazing tactical and operational-level victories while they swiftly marched east. Plenty of evidence existed that should have served to better warn and prepare Stalin's forces, but the early morning German attack clearly reaped the benefits of surprise, to include literally catching Soviet troops asleep in their billets.²

The initial stage of this invasion was nothing short of stunning (See Figure 2). When news of the invasion reached Washington, Secretary of War Henry Stimson told President Roosevelt that the Joint Chiefs of Staff's perspective was, "Germany will be thoroughly occupied with beating Russia for a minimum of a month and a possible maximum of three months."³ This quote reinforces the contemporary conviction that the Red Army was woefully unprepared for combat. It also indicates that Hitler's conviction that an attack on Russia would end quickly was shared by other significant military thinkers.

¹ Overy, *Russia's War*, 287.

² Department of the Army Pamphlet No 20-261a, *The German Campaign in Russia--Planning and Operations (1940-1942)* (Washington: Dept. of the Army, 1955), 44.

³ Overy, *Russia's War*, 327.

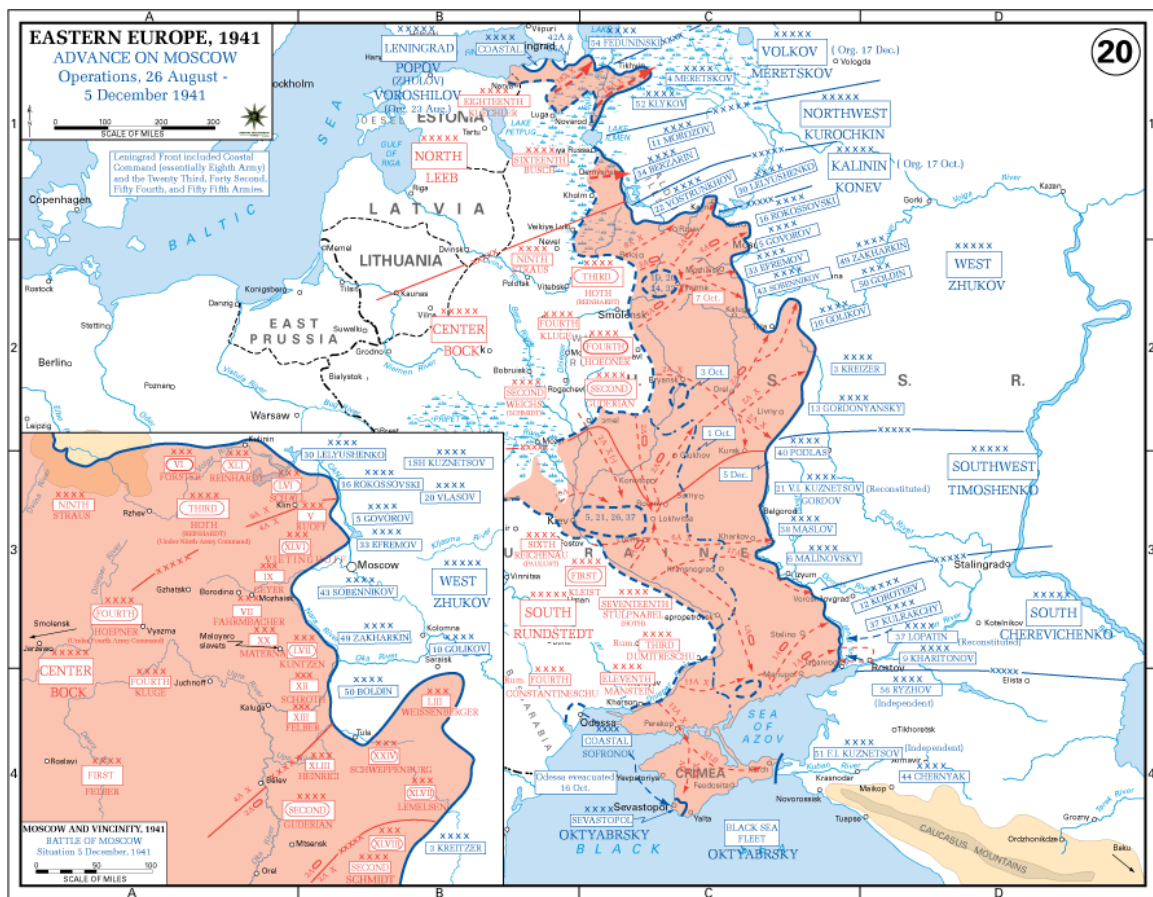


Fig. 2. First Phase

Source: *West Point Atlas of World War II*, plate 20.

The German army moved with relative ease through the Soviet defenders, under conditions of near-total air superiority. From June to December of 1941, German forces swept across the Western Soviet Union and culminated approximately at a line between Leningrad – Moscow – Rostov. Between December and April of 1942, a limited Soviet counteroffensive occurred in the center of the German line at Moscow and achieved modest success in pushing German forces back as much as 150-200 miles. From May of 1942 until 18 November 1942, German forces emphasized a southern push into the Northern Caucasus area, supported every step of the way by the Luftwaffe, and conducted a siege of Stalingrad. The limited nature of the spring 1942 campaign was a

symptom of a lack of long range planning: the German inability to complete their campaign plan by the fall of 1941 led to a series of improvisations.

Soviet records shed light on the scale of German success during their first encirclement of Soviet forces. Between 22 June 1941 and 9 July 1941, the Red Army suffered the loss of 417,790 Soviet soldiers out of an initial strength of 627,300 in contact. Glantz notes that the Germans lost 88,386 of 498,000 men in that same period.⁴ “Body counts” fail to tell the whole story, but they shed light on the disparity of losses between German and Soviet forces as well as the massive scale of the German envelopment efforts. In several cases, German mechanized corps were able to completely bypass Soviet tank divisions that had been rendered ineffective by lack of coordination, ammunition, and fuel.⁵ A US Army report published in 1955 summarized the early part of the campaign with the following conclusion:

In general, the Germans had every reason to be satisfied with the progress of the first nine days. The Luftwaffe had gained complete air supremacy. The Russians had been forced to give battle on all fronts. An organized withdrawal opposite Army Groups Center and North were no longer to be feared, whereas in the Army Group South area the Russians could still evade the German envelopment. In view of the heavy losses suffered by the Soviet forces, the overall success of the German operation seemed assured...⁶

In this theater, initial German successes were exponentially greater than even the previous achievements in Poland and France.⁷ Serious criticism of German combat performance is hard to find, but there is consensus among many historians that German forces should have more

⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 331.

⁵ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 51.

⁶ Department of the Army Pamphlet No 20-261a, *The German Campaign in Russia--Planning and Operations (1940-1942)* (Washington: Dept. of the Army, 1955), 45.

⁷ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 124.

effectively closed off their envelopments with increased speed and surety in order to reduce the numbers of escaping Soviet soldiers.

It is also significant that in addition to the size of the casualty lists, the campaign also included some of the cruelest Nazi atrocities. Neither side was innocent of cruelty, but Nazi (and especially SS) behavior was particularly loathsome, and news of it was communicated swiftly through Soviet forces. This resulted in enhancing Soviet motivation to fight to the death, since SS (and German army) mistreatment likely awaited those who were captured. This period clearly set the tone in Soviet minds. Not only were they fighting a German enemy with expressed unlimited aims, but their foe backed-up the fact that they meant business with unnecessary cruelty. Historian Alan Clark wondered if the Germans, “...realized they were sowing the wind? The first reaping, more terrible than anything they had experienced, was less than twelve months away.”⁸

The breathtaking German success had a terrible human cost. Table 3 contains a summary of captured Soviet troops in various battles of encirclement in the summer and fall of 1941. In the first six months of this period, an astonishing 3,137,673 Soviet soldiers were killed or captured (many POWs subsequently died after maltreatment). This represented two thirds of their mobilized strength! In addition, 1,336,147 were wounded. By the end of this first period, the end of 1942, the Soviets had suffered over 11 million casualties.⁹ The scale of German success was enormous in geographic terms as well. Between 22 June and December 1941, German forces penetrated greater than 1000 miles into Soviet held territory. The width of the attack front was approximately 900 miles. Hitler’s grand strategy assumptions relied upon rapid decisive victory. He demanded swift results and the initial stages

⁸ Clark, *Barbarossa: The Russian-German Conflict, 1941-1945*, 144.

⁹ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 123.

of Operation Barbarossa appeared to delivering a level of success that bred further over-confidence. History should have taught German forces the danger of attempting to fight through the Soviet winter.

The Soviet government had proven itself more resilient than Hitler had expected. Soviet ability to improvise and field new fighting units also surprised German leadership. Nevertheless, in loose accord with the ambitious plan and expectation of quick victory, German Army Group North surrounded Leningrad, and by the end of the 1942, German forces were pounding Stalingrad, and they had already been at the gates of Leningrad, and Moscow.

Table 5. German Battles of Encirclement of the Eastern Front, 1941

Date	Captured Prisoners	Tanks	Guns
10 July 1941	324,000	3,332	1,809
6 August 1941	310,000	3,205	3,120
9 August 1941	103,000	317	1,100
20 August 1941	84,000	144	848
16 September 1941	665,000	884	3,178
11 October 1941	107,000	212	672
18 October 1941	663,000	1,242	5,452
Total	2,256,000	9,336	16,179

Source: van Creveld, Air Power and Maneuver Warfare, 95.

Second Phase of War: 19 November 1942 – December 1943

19 November 1942 marked the commencement of the Soviet counteroffensive at Stalingrad. The period between this counteroffensive and the end of December 1943 forms the second phase of the Great Patriotic War. The battle of Stalingrad was a significant victory for the Red Army, and many historians view the Soviet victory on the Volga as the key turning point of the Eastern Front. Others give this honor to the

later battle of Kursk (July 1943). Kursk represented the largest tank battle in history and also featured the combat debut of a much matured Soviet tactical airpower capability.

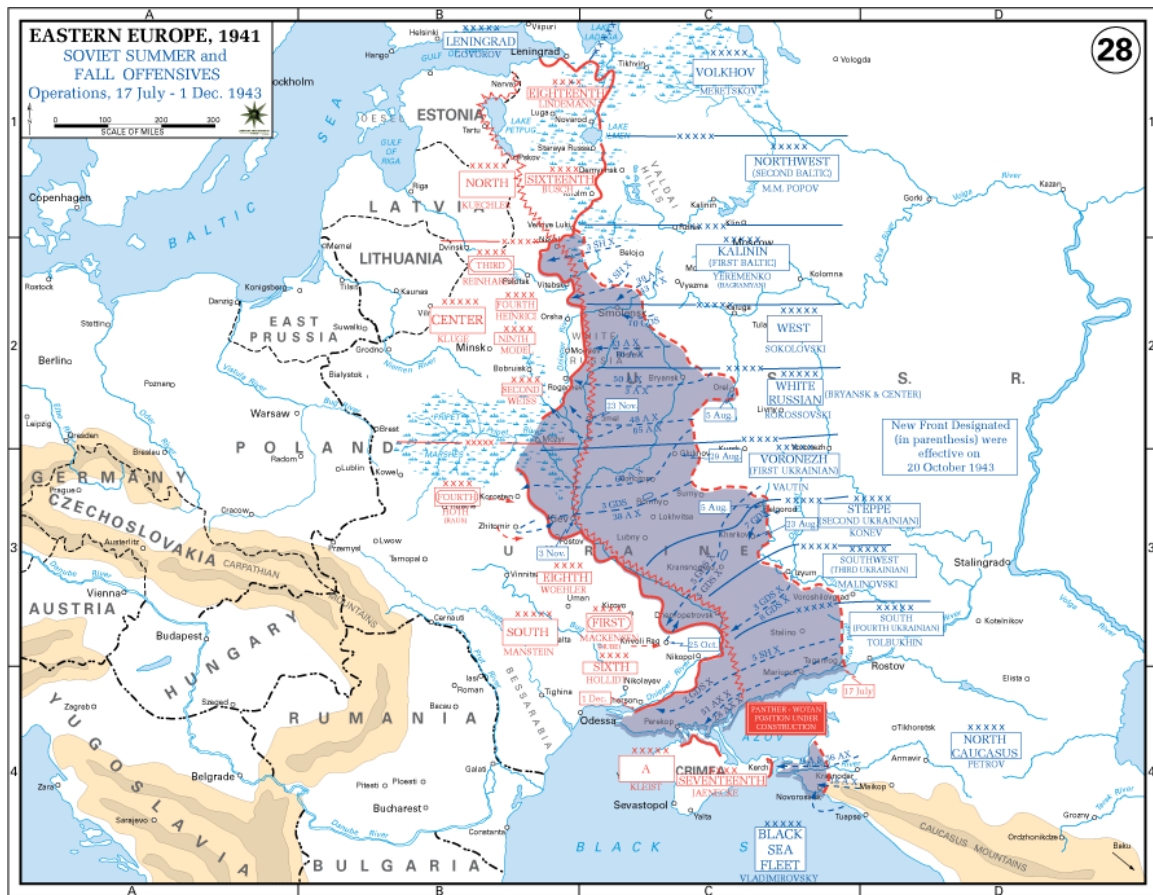


Fig. 3. Second Phase

Source: West Point Atlas of World War II, plate 28.

At Stalingrad, the Red Army carried out an impressive encirclement operation with massive pincers (aided by an astute deception plan) that surrounded the German 6th Army and effectively entombed it. Germany was forced to attempt an air bridge to resupply the besieged 6th Army with the necessary 750 tons of supplies per day in the middle of winter. To accomplish this, the Luftwaffe would require the deployment of 1050 Ju 52 transport aircraft. This level of support was unavailable and the requirement was eventually lowered to 300 tons

daily. Average level of airlift support was 84.4 tons per day and the maximum was 289 tons.¹⁰ There was no way sufficient supplies could be sustained in the face of a comprehensive Soviet “air blockade,” and since Hitler forbade a breakout, the German 6th Army was doomed.

The battle of Kursk (Operation Citadel) was a German attempt to eliminate a Soviet bulge at Kursk in July of 1943. The Germans desired to cut through the strong Soviet positions that extended westward near Kursk. The German intent was to straighten the front line and enhance German communication near the front. The operation failed and by the end of December 1943, the Soviets would seize and maintain the initiative, combining armored maneuver with lavish tactical air support, against the German invaders.¹¹

The second phase of the war was thus characterized by Soviet defeat of the German 6th Army at Stalingrad (Operation Uranus), Soviet success at the Battle of Kursk, and the Soviet army driving the southern German forces west toward Kiev. During this period, the Soviets attained the initiative, and kept it until the end of the war.

Final Phase of War: January 1944 – 9 May 1945.

The final period started in January 1944 and ended when Berlin was captured on 9 May 1945. The fundamental change of this period is that the Red Army and Air Force had sufficient time to evaluate and improve their performance. Their losses had been such that they could not afford to continue to allow needless attrition. Therefore the Red Army began to conduct more sophisticated maneuver attacks.¹² The combined-arms capability also improved.

The 1944 Field Regulations of the Red Army included techniques for conducting artillery and air offensives to provide continuous support

¹⁰ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 108.

¹¹ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 178.

¹² Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 180.

to ground forces.¹³ The pattern of engagements consisted of an almost continuous series of battles. The Soviet approach was to concentrate and gain local superiority without giving advance warning. Soviet leaders also demonstrated the flexibility to rework their approach when German resistance was stronger than anticipated. The summer and fall of 1944 were disastrous for German forces as Soviet commanders began to beat the Germans at their own game.

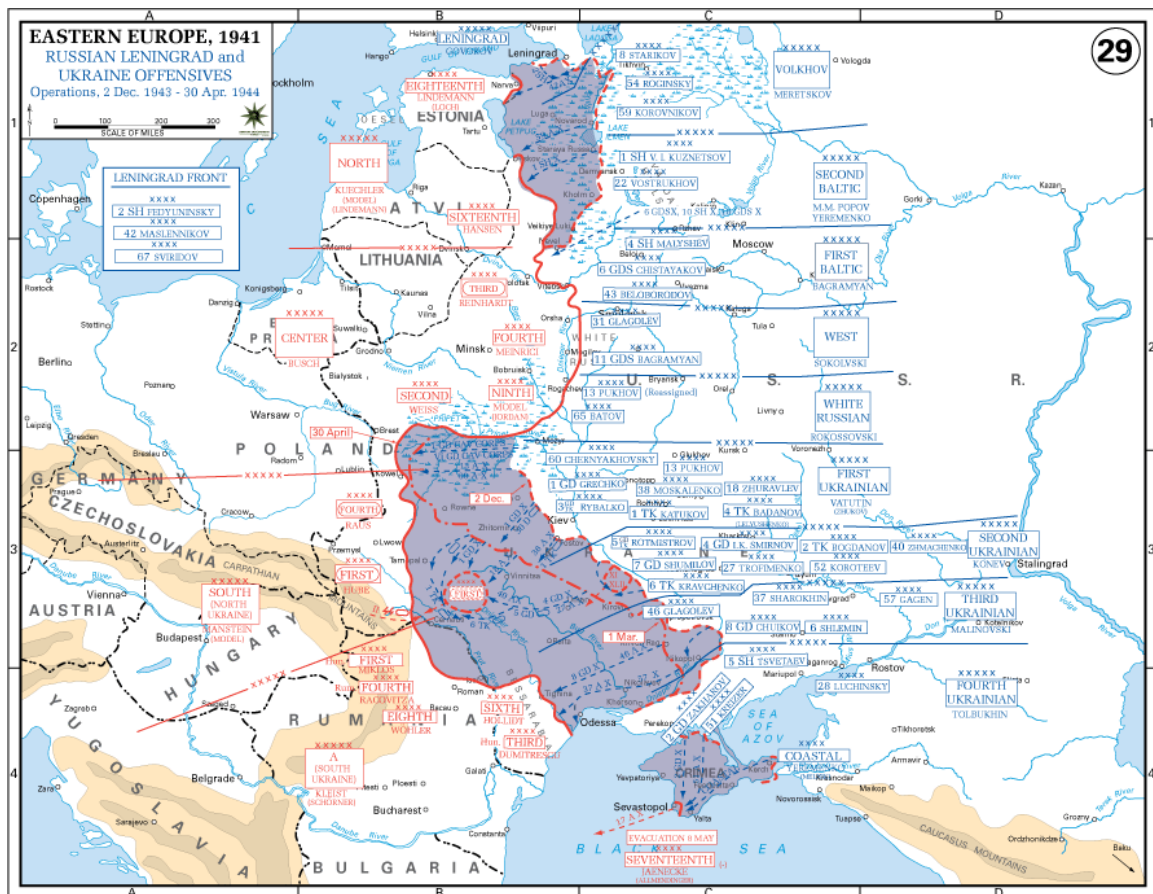


Fig. 4. Final Phase

Source: *West Point Atlas of World War II*, plate 29

Historian David Glantz noted that the first and third phase of this campaign were each approximately 18 months long. Each conforms to a “gruesome symmetry”¹⁴ due to the fact that each side fundamentally

¹³ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 181.

¹⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 274.

switched roles. The skill and efficiency of the eastward German drive against an ineffective Soviet defense was replayed in the opposite direction. The Soviets conducted impressive feats of maneuver and destruction as they rapidly drove the Germans back to Berlin. The victory was impressive, and rejuvenated Soviet airpower played an indispensable role.

Organization and the Meaning of Airpower Independence

Airpower should be conceptualized as a flexible and powerful tool when in the hands of the theater commander. Rather than engage in endless discussion about what constitutes “decisiveness,” airpower advocates must be knowledgeable about the historical uses, misuses, strengths, and weaknesses of this instrument of military power. The Eastern Front provides a rich array of examples which have gone unnoticed and unstudied for far too long by Western air strategists.

The meaning of “independence,” although at the heart of so many airpower debates, is ambiguous at best. It is beyond the scope of this paper to trace every nuanced meaning of this word, but as often the case, how a word is defined may be the key to resolving disagreements about the use of airpower. Often, organizational independence is associated with the willingness to invest in or conduct long range, or strategic bombing. However, independence may also refer to a tactical use of airpower which does not directly support the army, but still exerts a profound effect on the course of a campaign.

This phrase applies most appropriately to the peacetime functions of organizing, training, and equipping forces for eventual assignment to a war zone. The wartime applicability fades rapidly. For example, neither the German or Soviet armies were independent: they existed to satisfy the military needs of their respective societies and were beholden to their political leadership. Hitler directed, in minute detail, the actions of his army. Thus their ground forces were not even independent, nor would they ever be. It was Hitler who decided if or when the drive toward

Leningrad or Moscow would begin, even over the misgivings of his professional military. He also decided when German forces were permitted to attempt to break out of hopeless Soviet encirclements. Moreover, both armies operated in a combined arms fashion with air and (to a lesser extent) naval forces.

Hitler's Directive 21, which called for the planning of Operation Barbarossa, directed that the Luftwaffe's first objective was to eliminate the Soviet Air Force and prevent it from impeding the German advance, and the second task was to support the German army. Despite Luftwaffe "independence," this directive forbade German air attacks on Soviet armament industry until these critical tasks were discharged.¹⁵

A classic distinction potentially made between the Luftwaffe and the VVS is that the Luftwaffe was organizationally independent. Therefore, one might anticipate that the Luftwaffe would invest in a long-range bomber capability and the VVS might emphasize the development of a direct ground support force. However, this prediction does not seem to be borne out by events, as both air forces emphasized tactical support of army forces. Furthermore, by 1935, the Soviets had the largest bomber force in the world.¹⁶ Evidently, there need not be a correlation between organizational independence and emphasis on bombardment operations.

In 1941, one of the biggest shortcomings of the VVS was its inability to mass and apply concentrated force when necessary. This problem was solved through organizational restructuring into Air Armies. Insightful VVS leaders such as A.A. Novikov, a man who narrowly missed being eliminated in the purge, eventually established a responsive command structure in response to the failures of the initial period of Barbarossa. The resulting organization achieved marvelous

¹⁵ Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945*, 79.

¹⁶ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 47.

improvements in VVS capability. Of special note was the vast growth in the air force's ability to concentrate airpower when required. This improvement did not require independence, only clarity in seeing the problem and directly addressing it. Novikov applied good, innovative leadership and a combined arms perspective to this challenge. Yet it was not accomplished in a single leap forward; it took a period of trial and error.

In March of 1942, the Stavka disbanded the Aviation of the High Command (DBA) and replaced it with a new organization, Long-Range Aviation (ADD) which fell under the Stavka's operational control. This new organization consolidated transport and long-range medium and heavy bombers under one command. The DBA only controlled a portion of the bomber aircraft, while the rest were divided up among the army units they supported. This organizational change was intended to enhance Soviet ability to engage strategic and rear area targets. This new organization grew to consist of 50 air regiments, with a total of 1,500 aircraft. Clearly, the VVS was in the process of trying to determine the optimal approach to airpower organization, command relationships, roles, and most appropriate application. The resulting structural transition was initially not very productive for Soviet aviation because the demands of the struggle for air superiority and the emphasis on tactical aviation took priority.¹⁷ This attempt was, however, noteworthy in its efforts to provide force concentration.

There were three main contributors to the eventual VVS improvement in concentration. The first was a significant change in command. Stalin, as noted above, had placed General A.A. Novikov as the new VVS Commander. His vision was to further consolidate aviation units assigned to the fronts and the armies into larger organizations. These new, larger organizations were called "air armies." With larger

¹⁷ Greenwood and Hardesty, "Soviet Air Forces in World War II," 44.

organizations under a single commander, concentration became much easier to achieve. These organizational changes, combined with enormous increases in annual aircraft production, brought about a significant improvement in VVS performance. In 1942, Soviet aircraft production was 25,436, and in 1944, production had climbed to 40,241.¹⁸ Lastly, Novikov also emphasized the use of air reserves. Reserve air units, capable of swift deployment to a battlefield hot spot, further enhanced VVS capability to achieve mass when required. In some cases, reserves represented between 48 and 63 percent of the VVS total frontline strength.

Novikov worked intensely with (Stalin's Deputy as Defense Commissar) Soviet Army Commander General Georgi Zhukov in order to, "develop effective interservice liaison and cooperation and improve the strength and state of readiness of his air armies."¹⁹ Not surprisingly, the personal relationship between Novikov and Zhukov was very important. Both leaders were no-nonsense and efficient. As George Kenney did with Douglas MacArthur and Elwood Quesada did with Omar Bradley, Novikov earned the admiration and trust of his demanding commander.

Initially, Novikov's larger Air Army construct was unwieldy and did not result in sufficient flexibility. He massaged his concept until finally finding the winning combination. Each Front was ultimately equipped with its own air force, which could concentrate as required on that front. He ensured the creation of thirteen reserve air corps by the end of 1942.²⁰ Under Novikov's leadership, the VVS maintained their prioritization of fighters over other forms of airpower. Novikov's innovative organizational construct of the Air Army allowed robust support for frontal aviation and brought about an increase in centralized

¹⁸ Greenwood and Hardesty, "Soviet Air Forces in World War II," 47.

¹⁹ Joel S. A. Hayward, *Stopped at Stalingrad: The Luftwaffe and Hitler's Defeat in the East, 1942-1943* (Lawrence, KS: University Press of Kansas, 1998), 225.

²⁰ James Sterrett, *Soviet Air Force Theory, 1918-1945* (New York, NY: Routledge, 2007), 101.

control of air operations. Novikov maintained his commitment to the idea, dating back to the early days of “Deep Battle,” that after achieving air superiority, the main objective of aerial warfare was “decisive massing on the axis of the main blow.”²¹

VVS equipment, especially the Il-2, was very effective and Novikov reaped the benefits of the support of a distant industrial base which could build increasingly more numerous quantities of these highly-effective aircraft models. Novikov even personally managed the air support arrangements for the battle at Stalingrad. In short, Novikov cast a vision for practical airpower to most effectively suit his nation.

Novikov and his pilots studied combat results for potential lessons.²² He also displayed personal qualities of imagination and flair. Under Novikov’s leadership, the VVS demonstrated willingness to conduct significant self-evaluation. They borrowed successful techniques from the Germans such as more flexible formations. He also employed decoy airfields and disguise of his air units’ buildup in order to provide some protection from German air attack.²³ In the words of Von Hardesty, “The crucial Novikov reforms of 1942 sought to adapt VVS organization to the exigencies of the Eastern front and to provide the basis for offensive air operations; by design, they created an air force to meet the priorities of centralized control, mobility, and concentration of firepower.”²⁴

Unfortunately, under Stalin’s despotic rule, no good deed was left unpunished. Despite the fact that Novikov was one of the great wartime airpower leaders, Stalin had him arrested, interrogated for days by the

²¹ Sterrett, *Soviet Air Force Theory, 1918-1945*, 103.

²² Sterrett, *Soviet Air Force Theory, 1918-1945*, 111.

²³ Hayward, *Stopped at Stalingrad: the Luftwaffe and Hitler's Defeat in the East, 1942-1943*, 225.

²⁴ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 218.

KGB and then sentenced to prison isolation. He was released after Stalin's death almost six years later.²⁵

German strategic errors on the Eastern Front and elsewhere diminished the ability of the Luftwaffe to achieve a similar concentration of effort.²⁶ A 1944 Luftwaffe study noted, "The course of the air war since 1941 has been characterized by the fact that the Luftwaffe has not been used again in concentrated attacks against one opponent on one front. It has been forced by simultaneous operations in several theatres of war to direct its blows at the enemy in many directions. The inevitable result has been a decrease in its operational strength on the various sections of the front."²⁷ By 1943, the Germans were essentially fighting a four-front air war: in Russia, in the Mediterranean, in the West, and in the day and night skies over Germany proper. Poor grand strategy had robbed them of the opportunity to focus on any single AOR.

The VVS, like other air services, faced challenges of institutional identity, purpose, and mission. A 1954 RAND study points out that, "There has never been an independent Soviet air force establishment corresponding to the USAF. The organization of Soviet air power conforms to a considerable degree to its functional missions."²⁸ The study notes that there are six different Soviet air forces. One of these air forces is an independent long-range bombing force which had been independent since 1942 (except for one brief period.) However this unit's record did not support calling it a strategic bombing command.²⁹ Postwar writings include a 1949 conclusion by a Soviet colonel that stated, "No independent operations of aviation can play such a role as

²⁵ Brookes, *Air War Over Russia*, 150.

²⁶ Muller, *The German Air War in Russia*, 230.

²⁷ Muller, *The German Air War in Russia*, 230.

²⁸ Garthoff, *Soviet Attitudes Toward Modern Air Power*, 2-3.

²⁹ Garthoff, *Soviet Attitudes Toward Modern Air Power*, 3.

operations conducted in the interest of the ground forces.”³⁰ In a 1950 article, a different Soviet colonel rejected “the pseudo-scientific theory that a war can be won by bombing alone.”³¹ These quotes do not prove official policy. Rather, they imply that Soviet military discussions reflect challenges to air service development similar to those that faced the USAF and RAF.

The Commander in Chief of the Luftwaffe, Hermann Goering, was second in command to Hitler, AND the air force he led was officially independent. Yet, direct and indirect support of the ground forces remained the Luftwaffe’s emphasis. For example, below are several guidelines listed in a 1 August 1939 document from the 3d (Tactical) Department of the Luftwaffe general staff and signed by General der Flieger Hans Jeschonnek, the chief of the general staff:³²

1. In the conduct of air warfare, one must distinguish between independent air actions and actions carried out in direct support of the army.
2. All successful air attacks have a direct or indirect effect upon the combat operations of the army.
3. Independent air operations have a direct effect in that they bring about a gradually increasing restriction of the enemy’s freedom of action in all important military and economic sectors. These actions require a certain amount of time to have an effect on the ground forces.
4. Moreover, it may be necessary in certain ground situations for the Luftwaffe to exert an immediate and direct effect on the conduct of the ground war.

These situations arise if the army is engaged in potentially decisive or especially important battle operations.

5. The versatility that accompanies independent air warfare makes the air force capable of performing tasks that require well-considered force allocation among various combat actions.

³⁰ Garthoff, *Soviet Attitudes Toward Modern Air Power*, 7.

³¹ Garthoff, *Soviet Attitudes Toward Modern Air Power*, 7.

³² James S. Corum and Richard Muller, *The Luftwaffe's Way of War: German Air Force Doctrine, 1911-1945* (Baltimore, MD: Nautical & Aviation Pub., 1998), 195.

The request of the army for direct support can therefore only be complied with if there is a need for bringing about a decisive or immediate result.

Germany's most significant prewar airpower theorist, Major Hans-Detlef Herhudt von Rohden, believed that the US, unlike Germany, was well suited to conduct strategic operations due to its size and location.³³ Any conflict involving the US would need to take into account US economic power and distance from potential enemies. Germany was in a far less enviable position and had to focus on tactical operations out of necessity.

In a 1946 essay, Gen Spaatz noted that a German weakness was they were land-minded and that, "In planning their aggression they did not allot their air force an independent mission of strategic offensive. Consequently they failed to meet their one historic opportunity to win decisively and quickly in 1940."³⁴ Spaatz was certainly familiar with the organizational intricacies of the enemy he had recently finished fighting. He knew the Luftwaffe was independent. There is a touch of irony to say that American security interests support establishment of an independent USAF, possibly to avoid being too "land-minded" even though the Luftwaffe's "independence" did little to prevent them from traveling the same road. Yet, the distinction between organizational independence was clearly very distinct from the commitment to conduct missions independent of direct army support.

Organizational independence may provide some advantage during peacetime procurement of new equipment and training, especially in an adversarial domestic environment. It conceivably offers some insulation from the parochial concerns of the parent service. However, in the final analysis, even this scenario must accept the fact that civilian leadership,

³³ Muller, *The German Air War in Russia*, 12.

³⁴ General Carl Spaatz, "Strategic Air Power: Fulfillment of a Concept," *Foreign Affairs* April 1946, 395.

which is not always sufficiently air-minded, has the final say. Goering's influence upon the Luftwaffe was also directly connected to his relative level of power and prestige within the German government. It should be conceded that organizational independence offers an avenue for a louder voice in the debate over the allocation of scarce resources. When Goering's prestige was high, his Luftwaffe benefitted; when his star waned, so did his air force's position at court.

The connection between independence and strategic bombing leads to discussions regarding the effectiveness of strategic airpower. Strategic bombing in World War II was not independently decisive. A more plausible conclusion was that long-range bombing had a strategic influence by reducing the enemy's freedom of action. It did this through destruction or diversion of resources. Strategic bombing did not collapse enemy morale or industrial capability. For example, the threat of British and American strategic airpower required Hitler to respond by diverting resources to air defense (flak and fighter) units to Germany.³⁵ These expenditures of materiel and personnel (even if civilian), could no longer be used to support other German endeavors. Likewise, German V-1 and V-2 deployment, similar to the threat of Scud missile attacks during the first Gulf War, required a disproportionate Allied military response to find and eliminate research and development facilities and launch sites. The impact of the Allied response to these threats was more significant than the impact of the attacks themselves.

In the case of the Luftwaffe and VVS, despite the differences in institutional independence, the Soviet and German air forces became very similar by the middle of the war. Initially the VVS was grossly unprepared for the coming struggle. However, the VVS grew and adapted into a remarkably flexible and effective air arm. Both air services served nations that emphasized power projection through terrestrial means. It

³⁵ Edward B. Westermann, *Flak: German Anti-Aircraft Defenses, 1914-1945* (Lawrence, KS: University Press of Kansas, 2001), 295.

did not make much sense for either Germany or the USSR to pursue long-range strategic bombing to the same degree as the USAAF or RAF. Britain and the US found themselves having no immediate means of attacking Germany other than through long-range aviation. US theorists saw the distances involved and naturally emphasized the hoped-for impact of long-range bombing. Again, these differences are all contextual and do not really drive to the heart of proving that the Luftwaffe was better than that VVS simply due to the fact that it was independent. Perhaps the single greatest lesson modern airmen can take away from the Eastern Front is to incorporate broader working definitions of airpower effectiveness and its relationship to organizational independence.

Air Superiority

The Luftwaffe's success in achieving air superiority and providing both direct and indirect support to the German ground advance through the application of multiple Luftwaffe capabilities is a sterling example of the decisive contribution that an air force can make to an overall campaign plan—a classic “denial” strategy. The Luftwaffe prepared for its attack through significant photoreconnaissance efforts. By April of 1941, these missions provided a list of targets within 200 miles of the German lines.³⁶ Logistical requirements such as fuel and additional airfields were slowly built up and supplied while arrangements continued for the secretive arrival and placement of new German flying units into the operating area.

The opening air attack conducted by the Luftwaffe was so successful that it defies comparison with any previous operation.³⁷ At 0330, in the darkness of predawn 22 June 1941, thirty Luftwaffe aircrews flying flew He 111, Ju 88, and Do 17 aircraft attacked ten

³⁶ Martin van Creveld, Steven L. Canby, and Kenneth S. Brower, *Air Power and Maneuver Warfare* (Maxwell Air Force Base, AL: Air University Press, 1994), 67.

³⁷ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 12.

different Soviet airfields. The attackers avoided detection by ingressing at high altitude. Effective radar, like that used in the Battle of Britain, was not yet a threat to the Luftwaffe at the opening of Barbarossa. At the appropriate moment, the Luftwaffe pilots quickly descended in order to attack their targets. Their intent was to strike an initial blow against the VVS and induce havoc among the Russian forces.

At sunrise, 500 bombers, 270 dive-bombers, and 480 fighters hit an additional 66 airfields containing 75% of available Soviet aircraft. The German Luftwaffe conducted wave after wave of attacks. They faced only nominal resistance and noted no alert aircraft or attempts at dispersion. German results were astounding. The Soviet 9th Mixed Air Division of the Western Special Military District lost 347 of 409 deployed aircraft; the 10th Division lost 180 of 231; the 11th lost 177 of 199.³⁸

Soviet aircraft, like American forces at Pearl Harbor, were physically arranged in very vulnerable ways. In the first eight and one half hours, the VVS lost no fewer than 1,200 aircraft!³⁹ German attack efforts were greatly simplified as multiple targets were destroyed per pass. In the air, German Bf 109 pilots found the few adversaries who did get airborne to be unaggressive and untrained. The overall VVS response was spontaneous, uncoordinated, and purposeless.⁴⁰ Historian Von Hardesty points out, "Soviet Air Commanders, following confusing directives from Moscow, recklessly sacrificed scores of bomber squadrons in vain hope of destroying Luftwaffe staging areas."⁴¹ Contributing to this confusion was a German barrage of artillery which signaled the commencement of the movement of 3,800,000 German soldiers into Soviet territory.

³⁸ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 11.

³⁹ Murray, *Strategy for Defeat: The Luftwaffe, 1933-1945*, 81.

⁴⁰ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 12.

⁴¹ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 12.

Luftwaffe personnel were sometimes awestruck at their own success and at other times were bemused by VVS aircraft which made little or no effort to avoid danger. Just before noon that day, Soviet SB-2 and DB-3 aircraft (slow medium bombers) attempted to counterattack Luftwaffe airbases. At one location, the bombers arrived unescorted and the Luftwaffe shot down 20 of 25 bombers. In a different engagement, the Luftwaffe 3d Fighter Wing shot down an entire VVS regiment of 27 bombers in 15 minutes!

By the end of the first several days, the tally looked like this:

Table 6: VVS Losses, June 1941

Date	VVS Losses
22 June 41	1800
23 June 41	800
24 June 41	557
25 June 41	351
26 June 41	300

Source: Williamson Murray, Luftwaffe: Strategy for Defeat, 82.

According to Martin van Creveld, the German Armed Forces High Command reported 4,017 Soviet aircraft were lost at the cost of 150 German aircraft. Soviet losses were at 6850 by 12 July⁴² and 7,500 by September.⁴³ Prior to the invasion, the entire Soviet air strength was estimated between 8,000 and 10,000.

These results did not mean that Soviet airpower was incapable of fighting back. On 7-8 August 1941, 13 Soviet DB-3 bombers attempted a strategic bombing raid on Berlin. The raid succeeded in the sense that it did not result in the loss of any Soviet aircraft. Unfortunately, it caused only slight damage in Berlin. Like, the Doolittle raid, the

⁴² van Creveld, Canby, and Brower, *Air Power and Maneuver Warfare*, 69.

⁴³ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 60.

strategic effect may be greater than the sum of its craters. However, in this case, there doesn't seem to be much effect at all.⁴⁴

Soviet desperation resulted in an interesting approach to overwhelming odds. VVS pilots began using a technique of ramming German aircraft in order to defeat them. Unlike Japanese Kamikaze attacks which are essentially planned suicide missions to achieve a precise attack, the Soviet ramming, or *Taran*, was not intended to kill the Soviet pilot. A brave and skilled executor of *Taran* might rejoin next to a German bomber and slowly fly his propeller or wingtip into critical components until the German aircraft lost control. The Soviet pilot would then rely on talent (and luck) to get his own aircraft, now partially damaged, back on the ground. Hopefully, only minimal repair would be required. There was even an English language pamphlet written about the tactic for Anglo-American audiences. This tactic was employed more than 200 times throughout the war.⁴⁵ By 1943, as VVS training, equipment and confidence improved, this approach tapered off.

German air success was dramatic and worth study. Richard Muller points out, "At no point in the entire war did the Luftwaffe come closer to achieving its prewar aim of exerting a decisive influence upon the course of operations as during the opening phases of Operation Barbarossa. It is doubtful that any air force in the world in 1941 could have contributed so effectively to success in a major campaign as did the three eastern air fleets in those heady months of summer and early autumn 1941."⁴⁶ It is difficult to compare, but Royal Air Force efforts in the Battle of Britain come close to having such significant strategic impact. Thus, it is significant that Luftwaffe actions which most closely achieve decisive success for German military success was devoted to

⁴⁴ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 26.

⁴⁵ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 28.

⁴⁶ Muller, *The German Air War in Russia*, 231.

support of the ground force, both direct and indirect. It was not heavily invested in robust long-range, heavy bombing.

However, it was also doomed by factors which are highlighted by deeper factors than battlefield success, or overwhelming technical and tactical supremacy. Even if Luftwaffe doctrine had strongly favored strategic bombing, the enemy may perform an astonishing counter-move. One example which foreshadows the drastic turn which lay ahead occurred in July of 1941. The Soviet government conducted a monumental feat of strategic and historic importance. In response to potential that superior German ground and air forces would certainly overrun Soviet industry, Stalin directed his factories to be dismantled and moved safely to the East. Von Hardesty comments, “The herculean effort to transport more than 1500 industry enterprises beyond the Ural Mountains at the height of the German invasion marks one of the most impressive Soviet Wartime achievements.”⁴⁷ This is a significant factor that enabled Soviet production of a staggering 137,271 aircraft between January 1941 and June 1945. While American production figures are equally impressive, one must bear in mind that the Soviet accomplishment occurred in the face of enemy occupation and destruction of much of the USSR’s industrial areas. In any case, the Soviet industrial movement secured the basis for the material recovery of the VVS and ultimately hastened the regaining of air superiority.

After the German defeat at Stalingrad, the Luftwaffe attempted to reorient its efforts toward conduct of strategic bombing against the Soviet aircraft industry sustaining operations on the Eastern Front. Much like Western powers like the US and Britain, Germany hoped this might preclude further battles of attrition, and even they succumbed to a “fixation”⁴⁸ on strategic bombing as a panacea.

⁴⁷ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 31.

⁴⁸ Muller, *The German Air War in Russia*, 235.

Due to the exquisite success and the corresponding devastating failure of the VVS at the onset of the war, the Luftwaffe retained the initiative in the air for the first two years of the war. This fact carries two significant messages to airmen and joint warriors. First, the capability to rapidly achieve air superiority is an enormous advantage in warfare. In this case, the German military had an obvious asymmetric advantage. Initial air superiority was a decisive *contribution* to the early success of the Barbarossa campaign. Greenwood and Hardesty perhaps understate the point to say, "...the use of Soviet fighters in a ground-support role was minimal in 1941-1942 ... "49 It was minimal because of the vast number of Soviet aircraft that were destroyed or rendered inoperative.

Second, this German advantage was not long-term, but instead temporary and fleeting. The recovery of the Soviet Air Force following their near-total annihilation is a remarkable accomplishment. The resurgence began when the southern thrust of the German advance was stopped at Stalingrad in the fall of 1942. The Stavka planned a counterattack which included striking thirteen German airfields to reverse German air dominance. Unfortunately, this attack was prevented by weather and the effort to wrest initiative in the air from the Germans was delayed while the Luftwaffe continued to interfere with Soviet plans.⁵⁰

According to Clausewitz, "... the defensive form of warfare is intrinsically stronger than the offensive If defense is the stronger form of war, yet has a negative object, it follows that it should be used only so long as weakness compels, and be abandoned as soon as we are strong enough to pursue a positive object."⁵¹ Soviet Operation URANUS clearly demonstrates Clausewitz's point. With the brief exception of a Soviet counter-offensive in the cold of December, 1941 and early 1942, Soviet

⁴⁹ Greenwood and Hardesty, "Soviet Air Forces in World War II," 55.

⁵⁰ Greenwood and Hardesty, "Soviet Air Forces in World War II," 58.

⁵¹ Clausewitz, *On War*, 358.

forces had been driven back until the German culmination at Stalingrad. As Soviet forces drew back, deeper into Soviet territory, their lines of communication grew shorter and more manageable. Soviet leadership conserved strength and prepared for an opportunity to begin a counter-offensive.

During the Soviet preparation, they were able to achieve fighter numerical superiority of greater than 3:1. Defense of Stalingrad and then the Battle of Kursk were both examples of successful VVS airpower application. Airpower was primarily used for direct support against German tanks, artillery, and defensive strongpoints. After 1943, air cover and support for the Soviet tank armies eased the burden of the major Soviet offensives. Fighters would first achieve control of the air, attack aircraft and tactical bombers would then work in depth with specific tank armies to facilitate breakthrough and exploitation.⁵²

The Soviet determination for improving air superiority capability was significant. This was demonstrated by their adoption of more flexible formations, especially the two-ship *Para*. This allowed for more maneuverable and mutually supportive combat performance. With greater intra-formation flexibility, each aircraft was able to improve its support for its partner, not unlike the famous American "Thatch Weave." Furthermore, the VVS was fond of "free-hunting" which consisted of roaming fighter formations which patrolled in search of Luftwaffe aircraft to shoot down.⁵³ Greater emphasis was eventually placed on finding German bombers. This had the combined effect of destroying enemy machines, killing their aircrew, defeating their offensive operation, and drawing their supporting fighters into the fight. Increased VVS success further contributed to improved pilot aggressiveness and confidence which also enhanced their performance. Some of the air superiority

⁵² Greenwood and Hardesty, "Soviet Air Forces in World War II," 60.

⁵³ Robin D. S. Higham and Jacob W. Kipp, *Soviet Aviation and Air Power* (Boulder, CO: Westview Press, 1978), 96.

statistics speak for themselves. In 1941, 1 in 32 VVS sorties was lost, but in 1945 this ratio improved to 1 in 165. The Luftwaffe suffered the opposite trend: 1 in 25.5 in 1942 and 1 in 11 by 1945.⁵⁴ Improvements in the pursuit of air superiority were not limited to tactics and skills.

Soviet leaders demonstrated adroit understanding of airpower by recognizing that if they deployed their superior numbers in geographically separated areas, the Luftwaffe would likely be forced to divide its available forces to match the VVS. The VVS was able take advantage of the situation and maintain its superiority while stretching the Luftwaffe across a broad front. Thus, gaining air superiority was a combined effort of superior aircraft production, visionary leadership, improved tactics, and increased confidence.

Air-Ground Integration and Coordination

Both VVS and Luftwaffe were schooled in air-ground cooperation, whether as “Deep Battle” or “Blitzkrieg.” In the opening months, the Germans undoubtedly had the doctrinal technological, and experience edge. Luftwaffe-Army cooperation was superb. The Luftwaffe assigned liaisons to the army to help coordinate support for army requirements. Radio equipment for ground personnel and aircraft were steadily improving. Primitive but effective methods of identifying the location of advancing German forces included marking the ground with flags and banners. Improved methods included Stuka pilots riding in Mark III tanks as forward air controllers.⁵⁵ Despite the emphasis on effective coordination and cooperation, Hermann Goering refused to grant the army any control over air units. Liaison always took place through Luftwaffe channels.

Soviet air-ground communications were, in contrast, initially poor. A 1 April 1941 report from Zhukov stated, “The breakdown of combat

⁵⁴ Brookes, *Air War Over Russia*, 148.

⁵⁵ van Creveld, Canby, and Brower, *Air Power and Maneuver Warfare*, 68.

readiness of signals in the troops of the VVS in peacetime will lead to the paralysis of command in wartime.”⁵⁶ Weakness in both wire and radio communication was endemic in the VVS during the early part of the war and contributed to their inability to widely disperse aircraft, respond to the German attack with competence, and conduct effective ground support missions.

Over the course of the campaign between Germany and the Soviets, the main effort of the VVS was directed at supporting ground force operations and destroying enemy troops and equipment on the battlefield. More than 46% of the total VVS sorties were utilized conducting these tasks.⁵⁷ In a 1963 review of Soviet Military Strategy (eventually translated and published by RAND), Soviet Marshal V.D. Sokolovskii claims that the second most important strategic problem facing the Soviet Air Force was air superiority. VVS air superiority efforts utilized 35% of available sorties.⁵⁸ It is unclear if Marshall Sokolovskii’s analysis distinguishes between importance and weight of effort. The statistic that direct support of the ground force took 46% of available sorties compared to 35% for air superiority supports a claim that ground support required a greater weight of effort. It does not necessarily indicate which was most important. Significantly, the mission of air superiority was shared between tactical aviation units assigned to the front and to the National *Protivovozdushnaia Oborna* (PVO) which is an air defense structure consisting of anti-aircraft troops and fighter aircraft. In 1942-1942, this mission required 60-87 percent of available fighter strength. These sorties would protect rear areas as well as lines of communication. This weight of effort on defensive mission sets

⁵⁶ Sterrett, *Soviet Air Force Theory, 1918-1945*, 91.

⁵⁷ Vasili i Danilovich Sokolovskii, *Soviet Military Strategy*, RAND (Englewood Cliffs, NJ: Prentice Hall, 1963), 260.

⁵⁸ Sokolovskii, *Soviet Military Strategy*, 260.

diminished once Soviet forces began their series of offensives to drive the German troops back.⁵⁹

He does state that it required 30 Soviet sorties to shoot down a single German aircraft. In contrast, it took only 5 sorties to destroy a German aircraft while it was on its airfield. The fact that the VVS did not exploit this was due to the "...numerical and qualitative inferiority of [VVS] bombers, the complexity of this type of operation, and considerable underestimation by some air commanders of the effectiveness of strikes against airfields."⁶⁰ A grim reality is that destroying enemy aircraft on the ground is often easier but is less effective because it rarely involves killing highly trained aircrew. Just as rendering an airfield unusable to the enemy is a temporary measure, destroying aircraft is also a short term proposition as replacements arrive. Obviously, dead aircrew can be replaced as well, but initial training and infusing with combat experience requires a much greater investment of time. Machines devalue, crack, and fatigue during use and represent a theoretical peak of performance shortly after they leave the factory. In contrast, aircrew members are at their weakest immediately upon completion of formal training. They grow in experience and effectiveness as they are put to use. Thus, there is a certain logic which supports attempting to destroy enemy aircraft in flight. As the ability to rapidly produce aircraft increased, the relative return on investment for destroying them on the ground was reduced.

In the typical Soviet lexicon, "independent" means that the effort need not coordinate directly with ground units. Thus deep interdiction and strikes against economic targets beyond the front are deemed "independent." It has little to do with organizational structure. Independent air operations were conducted to destroy German economic and political centers, but they were not effective. During the conflict,

⁵⁹ Sokolovskii, *Soviet Military Strategy*, 261.

⁶⁰ Sokolovskii, *Soviet Military Strategy*, 260.

only 3.9% of VVS sorties were aimed at “enemy economic centers.”⁶¹ The VVS leadership concluded, quite correctly, that comprehensive air operations linked to the overall campaign objectives were winning maneuvers.

Thus the concept of the Soviet “air offensive” was eventually born. It consisted of two phases: preparation and support. Preparation could occur in a preliminary or direct form. In either case, the point would be to crush enemy defenses in the direction of the planned Soviet attack. Preliminary preparation would occur for one to three days before an attack. Direct preparation would last from 15 minutes up to two hours and could carry over into the actual ground attack.⁶²

Once a breakthrough was achieved, the VVS would transition to protect infantry, armor, and mechanized forces. Especially important was the protection of the flanks of Soviet armored columns. Highly mobile armor units could sometimes advance as much as seventy miles ahead of their supporting fires and thus would rely greatly on air support, reconnaissance, and resupply.⁶³

In the German assault upon Stalingrad, and the subsequent failed defense of their Stalingrad position, the Luftwaffe failed to devote sufficient effort to interdicting the buildup of Soviet forces used to encircle and defeat the German 6th Army. Fighting within the city had grown tight and made fratricide from the air too likely. Luftwaffe efforts failed to address the increased build up of Soviet forces.⁶⁴ In contrast, Soviet air efforts were critical in interdicting the air resupply bridge into the Stalingrad pocket. The German 6th Army surrendered at Stalingrad on 31 January, 1943. 90,000 German soldiers were captured that day as Germany’s single greatest loss up to that point.

⁶¹ Sokolovskii, *Soviet Military Strategy*, 260.

⁶² Greenwood and Hardesty, "Soviet Air Forces in World War II," 61.

⁶³ Greenwood and Hardesty, "Soviet Air Forces in World War II," 61.

⁶⁴ Muller, *The German Air War in Russia*, 91.

Soviet interdiction campaigns against enemy railroad and naval transport also took place between 1943 and 1944, but they sometimes took second place to other missions. During the battle of Kursk, the Soviets devoted only 139 sorties out of 26,019 to interdiction of German railroads. These 139 sorties were a portion of the 2,299 sorties flown by Soviet Long Range Aviation. Likewise, the Luftwaffe conducted very few missions beyond the front lines of this battle. Both air forces saw their duty was to support the ground force during their time of greatest need—in this case the greatest clash of armored vehicles in all of military history.⁶⁵ At other times, however, the VVS could focus on sealing off the battlefield and cutting German lines of advance and retreat.

Between 1941 and 1943, the weight of VVS efforts against enemy airfields was considerably higher in an attempt to diminish the Luftwaffe's asymmetric advantage. However, the VVS' initial lack of competence and experience prevented significant profit from these efforts and had the impact of reducing Soviet confidence in large counter-air efforts. A better investment appeared to be in direct support. They were also confident that the most decisive way to shut down an enemy airfield was to capture it.⁶⁶ Later, from 1943 to 1945, when the VVS had grown in confidence, quality, and quantity, it had the ability to defeat Luftwaffe aircraft in the air while maintaining direct and indirect support efforts.

The Soviet Army progressed with relative rapidity in 1944-1945 during which they applied 90-95% of their frontal aviation toward these air offensives. Major break-through zones at L'vov-Sandomir, Vistula-Oder, and Berlin were all examples where 1,500-2,500 Soviet aircraft were concentrated in order to exploit expected advantage.⁶⁷

VVS commanders favored maintaining their status quo of setting the conditions for sustaining a continuous, maximum pace of ground

⁶⁵ Sterrett, *Soviet Air Force Theory, 1918-1945*, 116.

⁶⁶ Sterrett, *Soviet Air Force Theory, 1918-1945*, 120.

⁶⁷ Hardesty, *Red Phoenix: The Rise of Soviet Air Power, 1941-1945*, 222.

force advance into enemy territory. This was in contrast to German movement and logistics. The Germans moved faster on the offensive but often required costly delays to regroup and resupply. The Soviet approach resulted in slightly slower progress but retained an advantage of reduced need for pausing to reset. The Soviets operated at a greatly reduced risk of culmination.

Aviation Support, Maintenance, and Logistics

The initial German ground and air assault upon the Soviets was made possible by their logistical and support efforts. Initially, these efforts were robust. However, as the war lingered on, cold weather, unreliable roads and travel efforts made continued maintenance and fuel efforts difficult to sustain. The VVS, on the other hand was falling back upon more permanent, better supplied locations for spare parts, repair facilities, and their aircraft, tools, procedures, and personnel were accustomed to the frigid cold of the winter campaigns.

According to two historians, “The Luftwaffe met this challenge by developing a highly mobile logistics and engineer force. In Poland in 1939 and in France in 1940, motorized Luftwaffe airfield and logistic units followed close behind the armored and motorized columns. Forward airfields for reconnaissance aircraft, Stukas, and fighters could be operational within twenty-four hours of their occupation.”⁶⁸ The Luftwaffe supply regulation of 1938 is an example of detailed planning and responsibilities for various leadership positions. It delegated and specified each organization’s responsibilities for logistics, supply, fuel, ammunition, and maintenance.

Yet the German logistical system broke down under the strains of the Eastern campaign. Unlike the Soviet military, which did a very good job of simplifying its maintenance and logistic requirements by limiting their basic support equipment and vehicles to three main types, the

⁶⁸ Corum and Muller, *The Luftwaffe's Way of War: German Air Force Doctrine, 1911-1945*, 186.

Germans failed to adapt to the austere conditions of the eastern front. The Germans had a large variety of vehicle types, as well as finely developed and overly complicated precision weapons and instruments. In a secretly taped conversation, one German prisoner critiqued German support requirements by stating that they seemed to have about a hundred different types of trucks, all with unique support requirements.⁶⁹ In August of 1941, an administrative change was enacted to streamline the logistics and maintenance of the VVS. These changes were the first steps to allow the VVS to recover from the initial blow dealt by the German war machine.⁷⁰ German efficiency notwithstanding, it was the simple Soviet approach to logistics that won the day.

One logistical development on the Eastern Front is well known—the doomed attempt to resupply the Sixth Army at Stalingrad by air. A study of the airlift reveals much about the difficulties of operating out of unimproved “bare bases,” many of which were under constant Soviet harassment. The sheer difficulty of selecting the necessary supplies, packaging them for delivery, and distributing them at the receiving end exceeded even the most pessimistic predictions.

Several years after the war, the USAF would conduct an air bridge to rescue West Berlin. General Curtis LeMay’s initial estimate for what could be brought into the Berlin Airlift was 225 tons daily—close to the maximum the Germans managed to fly into Stalingrad on any one day.⁷¹ The first day of the Berlin airlift carried 80 tons, and by February, 1949 it flew in 8000 tons in a single day.⁷² US airlift planners did briefly look

⁶⁹ Sonke Neitzel, *Tapping Hitler's Generals: Transcripts of Secret Conversations, 1942-45*, trans. Geoffrey Brooks (St Paul, MN: Frontline Books, 2007), 161.

⁷⁰ Greenwood and Hardesty, "Soviet Air Forces in World War II," 42.

⁷¹ Andrei Cherny, *The Candy Bombers: The Untold Story of the Berlin Airlift and America's Finest Hour* (New York, NY: Berkley Publishing Group, 2009), 252.

⁷² Cherny, *The Candy Bombers: The Untold Story of the Berlin Airlift and America's Finest Hour*, 508.

to the German example as a source of insights, but quickly concluded that the Germans failed because of a simple lack of “know-how.” The obvious challenges of combat makes the Stalingrad airlift a very different type of undertaking than the Berlin Airlift, where aggressive acts were just threats and the most likely danger was an accident due to weather or procedural error. Yet USAF leaders persisted in comparing the two operations, dismissing the German effort, and contributed to the pushing of Eastern Front experiences into the shadows.

The reversal of fortune between VVS and Luftwaffe was striking. The Luftwaffe, with its first rate technology and battle hardened aircrew, seemed to hold all the cards. In the early years of the conflict, Soviet pilots were frequently shot down behind their own lines, and they demonstrated a very passive and tentative operational posture which contributed to their losses. A frequent defensive response was to weave like a snake or assume a defensive circle. Soviet formations were also rigid and their tactics unimaginative. Initiative, in the wake of the purges, was frowned upon. To the credit of VVS leadership, Soviet approaches to tactics and operations changed significantly under the pressure of combat. Soviet air doctrine had already stressed the significance of air superiority. However, the VVS leadership demonstrated great willingness to adapt and learn from their wartime experience. The Soviet air force leadership, under the direction of General A. A. Novikov, established the War Experience Analysis and Generalization Section, which shamelessly adapted German techniques for Soviet use. For example, the VVS borrowed the Germans’ tactical formations and copied some organizational changes. They began to use the very flexible and responsive four finger formation the Luftwaffe originally developed in Spain. Furthermore, they established an elite character to the air superiority fighter organization with the creation of “Guards” fighter regiments. They pursued better aircraft, people, and

training.⁷³ Even top German aces who encountered the newly aggressive Soviet fighter regiments in the Kuban and at Kursk were astonished by their tactical proficiency and the quality of their aircraft. The “turkey shoot” days of summer 1941 were over, and the Luftwaffe was ultimately defeated by a first rate air force adversary—one of many cautionary tales from the campaign.

⁷³ Greenwood and Hardesty, "Soviet Air Forces in World War II," 50.

Chapter 4

Strategy and Airpower Lessons

Aviation must not desert the ground forces in their day of need.

VVS Commander-in-Chief Kornukov, 2001

The Eastern Front is the single most important campaign of the Second World War. Unfortunately, it is also the least appreciated by Western military historians and airmen. The lessons about the use of airpower, some of which have been highlighted in this study, represent a vast supply of examples and lessons about how aviation was used, offensively, defensively, tactically, and strategically with mixed results. In light of the diversity of opinion found among US airpower advocates since the dawn of military aviation, it is extremely unfortunate that air warfare on the Eastern Front is so little studied and understood. True, the USAF did launch a postwar project to study the air war in the East utilizing captured German generals; the project was never completed and the studies it did produce were used more by historians than by military professionals. The following chapter presents five main lessons intended to synthesize the information in previous chapters with the goal of inspiring contemporary airpower strategists, staffs, and commanders with additional lessons about the use of airpower. The five lessons are:

- I. The Eastern Front was the most significant contributor to the defeat of Nazi Germany**
- II. An incompetent enemy may become competent over the course of a campaign**
- III. Do not anticipate that using superior technology, maneuver, training, or competence will always defeat an enemy with ability and willingness to trade terrain or blood for time.**
- IV. Never treat your enemy with contempt**
- V. What constitutes a truly strategic application of airpower against an existential conventional threat?**

Significance of the Eastern Front

The Nazi war machine was extremely effective on the eve of Operation Barbarossa. Hitler's Center of Gravity (COG) was undoubtedly German military power, and there is no doubt that the biggest factor in diminishing that power was the struggle on the Eastern Front.

To be fair, the Eastern Front represents a challenge of greater significance than just conflict with the Red Army and Air Force. Congratulating a boxer for defeating an opponent who had just completed running a marathon is roughly analogous to claiming the Red Army was the only hero of the Second World War. In addition to fighting the Red Army, German forces battled distance, cold, and enormous lines of communication. The German decision to attack Russia was not based on solid analysis of Soviet power, economics, or a sufficient appreciation of political reality. Odds against German victory were daunting, and yet incredibly, they almost achieved victory—due in no small measure to their use of airpower. The German war machine was certainly extremely capable and effective. Had German forces been able to achieve victory on the Eastern Front, leave a holding force in place, and then concentrate on occupying the remainder of Europe and North Africa, the costs necessary to achieve allied victory with non-nuclear warfare would have been much greater.

Yet this did not come to pass. At the end of the war, German ground force dead, wounded, and missing on the Eastern Front were approximately 6.5 million. In contrast, German losses against the Western Allies in fighting from Normandy to Berlin totaled 527,890 men. Due to the variety of sources reflecting official German and Soviet histories, it is difficult to make a precise casualty comparison. Between September 1939 and 30 April 1945, the Germans suffered 7,956,000

dead, missing, or disabled.⁷⁴ Between 22 June 1941 and 9 May 1945, Soviet military deaths in battle, deaths in hospitals due to wounds or sickness, missing in action, or captured was 11,285,057. If wounded, frostbitten, or sick are included, this adds an additional 18,344,148 for a total of 29,629,205 total losses for the Soviet military.⁷⁵ Lack of Soviet preparedness certainly contributed to these high numbers, especially in the early stages in the war. Soviet tenacity demonstrated by struggling back to their feet after the summer and fall of 1941 represents an enormous benefit to Allied cause.

None of this discussion means to denigrate the contributions of all of the Allied nations to the defeat of Nazi Germany. That victory required the combined efforts of much of the free world. The Battle of Britain, the Battle of the Atlantic, the Combined Bomber Offensive, the Lend-Lease program, and the Second Fronts in the Med and Northwest Europe were all essential milestones on the way to V-E Day. The scale of the Soviet victory is evident—but what of airpower's contribution? If we accept that the bulk of German military power was destroyed in the east, then it behooves us to understand the nature of the airpower application that accompanied this success. And, as Chapter 3 has demonstrated, much of this successful airpower application was tactical, not strategic.

A Competent Enemy

German prewar assessment of Soviet capability was a mixture of valid and invalid conclusions. Hitler was concerned that the Soviets would eventually grow in strength and therefore needed to be quickly and decisively defeated, because the Soviets might conduct a surprise attack at the least opportune moment for Germany.

In this campaign, not only did Hitler woefully miscalculate the enormity of what he was undertaking, he also failed to consider that the

⁷⁴ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 307.

⁷⁵ Glantz and House, *When Titans Clashed: How the Red Army Stopped Hitler*, 292.

Red Army and VVS would gradually learn from and adapt successful German techniques, while also benefitting from German negative lessons. In maintaining logical consistency, this is understandable because Hitler could not entertain the idea that this war was going to last for more than a few months. In his mind, it certainly could not have lasted long enough for an enemy—especially a subhuman one--to change and improve to the degree that Stalin's forces eventually did.

The Wehrmacht was expert at maneuver and operational art. The Blitzkrieg concept utilized shock, speed, and solid coordination to conduct rapid breakthrough, envelopment, and destruction of enemy forces. These techniques were used in Germany's opening campaigns in the Second World War and they continued with the same stunning success through the opening months of Operation Barbarossa.

But Hitler failed to pay close enough attention to the lessons of Napoleon's similar failed expedition into Russian territory. Soviet forces were arranged such that German efforts to annihilate those forces could achieve partial success, but sufficient space to maneuver and escape remained. Thus Hitler was continuously drawn deeper into Soviet territory, stretching his lines of communication and subjecting his forces to brutal conditions.

Furthermore, Stalin had enormous human and natural resources available, and he was clearly willing to use any measures to ensure Soviet survival. He appealed to the nationalism of their motherland as a rallying cry for his people, and they responded to the existential and brutal threat posed by their German invaders. In one example, Stalin's callous, (likely necessary) treatment of his people assisted in the rapid relocation of their industrial centers beyond the Urals. Stalin was able to exploit the fact that his population was accustomed to deprivation to achieve the measures required for the defense of the state.

Thus, a strategy of annihilation may be effectively countered by an enemy that is willing and able sustain losses through attrition. This is

even more significant in wars of unlimited aims. Hitler's stated plan was to raze Soviet cities and turn ethnic Slavs into a slave class. It should not have surprised Hitler that he faced more than a moderate amount of resistance.

There are interesting parallels between 1941 Soviet Union and contemporary China. In the short term, China lacks the equipment, employment, and training quality available to typical non-Chinese forces. However, Chinese ability to apply economic power, industrial production, raw materials, an enormous population, and the ability to strategically withdraw deep into China makes conventional warfare against China a very daunting scenario.

Despising the Enemy

Hitler despised the Slavic people. He viewed them as sub-human and incapable of offering sustained resistance to his war plans. This conviction was so strong and unquestioned that alternative conclusions became impossible to consider. This contributed to shortsighted economic, logistic, and environmental planning. German industrial production remained in low gear; there seemed to be no need to increase production of required war materiel. In Hitler's mind there was no possible way that the war would last more than a few months; that German personnel would require winter gear; or that industrial production, supply, and logistics would require the amount of attention it ultimately required. In particular, the Germans failed to appreciate the lethal combination of vast Soviet productive capacity and their ability to develop and field superior second generation aircraft designs such as the Il-2 "Sturmovik."

On 15 April 1945, as Stalin's forces drew near to Berlin, Hitler released his Order 74. Given the fact that German defeat was quickly approaching, it makes sense that Hitler's communication would be intended to sustain German resistance. Hitler directed last-minute defensive plans, warnings, and concerns that Germans advocating

retreat should be executed. The irony of the following comments is striking. His claims of what lie ahead for a defeated Germany are exactly what Hitler's stated goals were for the Russian people. Hitler even refers to President Roosevelt as the greatest war criminal of all time! Thus, with this last published order, Hitler's failure to take his enemy seriously is still evident in the fear in his words:

Soldiers of the German Eastern front!

For the last time our deadly enemies the Jewish Bolsheviks have launched their massive forces to the attack. Their aim is to reduce Germany to ruins and to exterminate our people. Many of you soldiers in the East already know the fate which threatens, above all, German women, girls, and children. While the old men and children will be murdered, the women and girls will be reduced to barrack-room whores. The remainder will be marched off to Siberia....this time the Bolshevik will meet the ancient fate of Asia- he must and shall bleed to death before the capital of the German Reich....At this moment, when Fate has removed from the earth the greatest war criminal of all time [a reference to recently deceased President Franklin Roosevelt], the turning-point of this war will be decided.⁷⁶

Germany's failure to respect the creativity, tenacity, and lethality of the enemy is not limited to the Eastern Front, nor is it unique to Germany during WWII. Failure to properly frame the problem and analyze the enemy's strengths and weaknesses still confronts American forces in the Global War on Terrorism. Worse yet, it is also sometimes accompanied by dismissive criticisms about perceived cultural backwardness or the fact that, "They're only terrorists!" This is a warning against dismissing the enemy or failing to appreciate that the enemy may adapt, improve, and surprise.

If we treat potential enemies with respect, we then prepare for all contingencies. The first identifiable area of required preparation and

⁷⁶ Trevor-Roper, ed., *Blitzkrieg to Defeat: Hitler's War Directives, 1939-1945*, 212-13.

strength is maintenance of our economic and industrial capacity, rather than assume that existing capabilities will suffice. We must also consider not only the possibility of failure, but also the consequences of success. For example, if German forces had succeeded in capturing Moscow as directed by Hitler's directive 21, what next? Assuming Soviet forces had retreated to the east of Moscow, German forces would have been confronted with continuous warfare on the Eastern Front unless they succeeded in destroying every last means of resistance. The Luftwaffe and German Army might have mutated into a vast COIN force. The remaining Red Army would not likely have accepted a peace agreement at that point, like Hitler hoped to achieve in Western Europe. Because the diplomatic approach to maintaining a peaceful Eastern Front was rejected at the start, Hitler's likely one chance to focus his efforts on a successful single Front slipped from his grasp.

Which is Truly Strategic: Supporting or "Strategic" Airpower?

The word "strategic" is multi-faceted. As an adjective, it implies an application of effort which lacks an immediate payoff, but assumes a more favorable payoff when that time comes. Attacking an oil refinery may not cause surrender today, but, as the theory goes, it might increase "fog and friction" within the enemy's combat capability, reduce their effectiveness, and eventually lead to enemy failure.

In this sense, "strategic" reflects a commitment to an idea. It implies a hope that the best contribution to an effort may not pay off with empirically verifiable data in the short term, even though it makes an enormous contribution to victory. On the Eastern Front, traditional strategic airpower was not applied to any great degree. However, the direct support and indirect support of both nations' air services were the most strategic use of airpower appropriate to their circumstances.

For example, the VVS directly contributed to the advance of the Red Army, the interdiction of German forces approaching the battlefield, and the destruction of Luftwaffe fighters. The Red Army's advance

toward Berlin was the ultimate strategic move. Furthermore, the VVS was able to produce a long-term advantage by destroying Luftwaffe aircraft while simultaneously strengthening the Red Army's position, its flanks, and destroying approaching or retreating German ground forces in the short term.

In this campaign, air superiority continued to remain the first, and most important, goal for the air component. Achieving supremacy in the air was a lofty goal and never really achieved, even in the aftermath of the Luftwaffe's deadly assaults in the first few weeks of the campaign. Even after the tide turned, the Luftwaffe was able to seize local air superiority on occasion. The Eastern Front examples imply that local superiority may be the best outcome of an air effort. True, permanent air supremacy is a bridge too far—but it is often unnecessary. Additionally, killing enemy aircraft with the pilots still in them has increased risk (they'll defend themselves prior to perishing) but has an enormous payoff in human capital and training investment. Finally, unlike US and British efforts to fly long-range sorties into German territory in order to destroy airborne German fighters, the VVS needed only to take off on tactical missions in order to meet and destroy German aircraft.

Airpower Tree Analogy

Once air superiority has been reasonably achieved, an enemy's military capability is like a large tree which must be cut down to clear a field. There are several ways to destroy the tree, some effective and some not. Strategic Bombing zealots prefer to destroy the tree by attempting find a very important root and cutting it and depriving the tree of what it needs for life. Unfortunately, available tools prevent accurate application of a cutting instrument against that all-important root. Even worse, intelligence efforts are incapable of reliably determining the location and nature of the perfect root to cut. It cannot reliably be determined before the fact. Others, believing themselves as "outside-the-box" thinkers,

believe they should remove all the leaves of the tree in order to kill the tree, a time consuming task.

The wisest and most elegant solution may be to strike the tree at its trunk. The effort expended to chip away at the trunk directly weakens the tree, reduces the flow of nutrients, and decreases overall tree health. Obtaining positive results from the investment of effort is often more certain.

An argument may be made that identifying which tree to chop down is not easy. Getting this correct is similar to the guesswork associated with deciding which area of the root system should be attacked. This may be true in the case of coercing an adversary whose actions do not require the use of a fielded force. In the case of combat on the Eastern Front, the correct tree was the tree doing the shooting.

Thus, once sufficient air superiority has been achieved, the Eastern Front was an example of how the direct and indirect support of ground component was likely the most appropriate use of airpower.

Strategic Airpower

British and American bombing efforts exposed Germany to the threat of the attrition of its capability in its rear area. It also reduced German freedom of action. German decision makers were subjected to the threat of bombing, and German planners were compelled to utilize resources to defend the German homeland with Luftwaffe and Flak units, with accompanying vast amounts of resources, training, and manpower. It effectively produced a new front, in the third dimension, that forced Germany to respond. Manpower, even if civilian or otherwise not suitable for frontline military service, is applied in one area, it extracts an opportunity cost. According to British studies, German aircraft production actually increased through the end of the war.⁷⁷ Yet those

⁷⁷ Jurgen Brauer and Hubert P. Van Tuyl, *Castles, Battles, & Bombs: How Economics Explains Military History* (Chicago, IL: University of Chicago Press, 2008), 208.

aircraft were overwhelmingly defensive fighters, as bomber production was wound down—and with it the Luftwaffe's offensive ambitions.

However, prior to D-Day, there were few options for projecting power against German-occupied Europe. Use of heavy bombers, with escorts, represented the only option available for much of the war. German fighter aircraft and pilots were attrited, as were the other resources applied to the German air defense effort.

Thus, the air battle on the Eastern Front of the Second World War suggests significant lessons about the application of airpower, concentration of airpower, and the impact of organizational improvement. The lessons are significant and should be studied. Unfortunately, history has not been on the side of open-minded evaluation. For example, Ben Lambeth states, "by making strategic bombing synonymous with airpower, strategic bombing theory effectively excluded some of the most potentially decisive aspects of airpower from its own scale of effectiveness....In the process, those who sought to prove that strategic bombardment alone was a war-winning capability did a grave disservice to the interests of broader air power concepts."⁷⁸

⁷⁸ Benjamin S. Lambeth, "Bounding The Air Power Debate," in *Strategic Review* (United States Strategic Institute, 1997; reprint, RAND), 47.

Conclusion

No independent operations of aviation can play such a role as operations conducted in the interest of the ground forces

Anonymous Soviet colonel

The Eastern Front of the Second World War was *THE* decisive campaign of the war in Europe. The magnitude, ferocity, and lethality of fighting there defy the imagination. This is especially true in the American imagination which, understandably, gravitates toward American influence and effort in defeating Germany. Furthermore, the role of airpower in this story is even more interesting. What airpower did for Stalin's fight against a very dangerous, existential threat was to directly reduce German ability to produce combat effects upon the Red Army. For far too long, airmen have only given this topic cursory attention.

American airmen understand very little about the Eastern Front as a whole and treat the use of airpower in this theater as either a sideshow or an aberration. Rather than taking the German and Soviet application of airpower as worthy of serious study, it is dismissed or seen as flawed because it did not follow the preferred approach of American airmen in either this period or the decades that followed. Somehow, American airmen persist in the counterfactual argument that Soviet or German application of strategic bombing would have been a significantly more effective means of waging their air war in the east. Based on the demonstrated usefulness of tactical airpower in this theater, it seems very unlikely that dramatic changes in (particularly Soviet) approaches to airpower would have resulted in great improvements in lethality. Thus, the Eastern Front remains full of lessons and examples of the consequences of good, bad, wise, and careless assumptions, strategy, confidence, economics, industrial power, terrain, weather, and airpower.

The tapestry of experiences from the First World War, revolutions in government, the relative value of the individual and the whole of society, impact of the personal and philosophical idiosyncrasies of leadership personalities all greatly influence the type of national war making capability available to Germany and the Soviet Union. It is ironic that the airpower preference of many of the Soviet theorists and military thinkers of the interwar years saw the role of airpower in similar terms to how they're seen today, and yet the absence of strategic bombing or some 5-ring-esque decapitation approach renders this air theater as almost a footnote in history.

The Eastern Front should be taught in Professional Military Education (PME) as a learning laboratory of the dangers of ill-considered strategy, lack of military and national defense preparedness, the hazards of not seeing the threat that sits right before your eyes, and how under conditions of extreme danger, society can sometimes absorb much greater amounts of deprivation than is originally imagined.

Furthermore, the Eastern Front is an example of the use of airpower in a situation where crossing great distances was unnecessary in order to find and contact the enemy. For the USAAF and the RAF, there was little contact possible except to conduct long-range bombing of German cities, industries, and assets. These raids slowly attrited German fighter aircraft and, likely of equal importance, German fighter pilots. As allied ground units came into contact with German forces on their march towards the Reich, the importance of the use of airpower to conduct strategic bombing decreased as the necessity to conduct interdiction, indirect support, and direct support of ground operations correspondingly increased.

Just as efforts of American tactical airmen, like General Pete Quesada, were insufficiently appreciated once their active contribution was complete, so too have the efforts of men like Novikov and the VVS

been disregarded. Perhaps their contribution reflects an approach that, at some basic level, conflicts with preferred approach to airpower.

Even renowned historians such as Richard Overy are not immune from sounding overly dismissive. For example, his classic book *The Air War, 1939-1945* allots a mere ten percent of its pages to the Eastern Front. He devotes much more space to the enormous USAAF and RAF investment in heavy strategic bombing, yet is unable to produce completely convincing evidence that it resulted in greater reduction in enemy combat capability, as compared to those air forces which favored tactical applications.

The Eastern Front Air War is a further example of the importance of achieving air superiority. In this case, localized air superiority was often the best, achievable goal due to the enormous size of the theater. Also, air superiority is something that must not be taken for granted. The fact that it is earned today may still mean it will require a fight to maintain it tomorrow.

World War III does not seem visible on anyone's horizon. For that we should be glad. However, just as theories abounded about the impossibility of warfare in an economically interdependent pre-WWI world, the unexpected might happen today. American confidence that warfare with a competent near-peer competitor is unlikely should be suspect. American perspectives often fail to appreciate the threat posed by a nation with nearly unlimited manpower, rugged real estate to withdraw into, an ability to place the needs of the many above the needs of the individual, governmental authority to make draconian changes to the economy or industry (such as physically moving the major factories), strong industrial and factory systems, access to natural resources, and reasonably good technology. Of course, China 2010 is not the Soviet Union 1941—but why ignore the parallels?

Thus, there is a great deal to learn from the Eastern Front. It reminds of the value of sound strategy. It alerts us to possible uses of

airpower and how its application with a tactical emphasis sometimes has the greatest strategic effect because, in the case of combat with an existential threat, the destruction of fielded forces is often the most reliable method of defeating the adversary.

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